THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

JANUARY, 1894.

REMARKS UPON APPENDICITIS, BASED UPON A PERSONAL EXPERIENCE OF ONE HUNDRED AND EIGHTY-ONE CASES.

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The subject of the treatment of appendicitis is by no means exhausted. Since my last report of eighty-seven cases, published in the *Boston Medical and Surgical Journal* of August 4, 1892, I have seen one hundred and two cases in which the question of operation for a probable appendicitis was raised. Of these, eight proved to be some other abdominal disease, as shown either by operation or by autopsy. In the remaining cases some affection of the vermiform appendix was undoubtedly present. This list does not include the cases I have seen with my colleagues at the Hospital. In my own there have been forty-three deaths. At least thirteen of these were moribund at the time of my first visit. In my private surgery the deaths from this disease have exceeded many fold those from all other causes combined. In the surgical wards of the Massachusetts General Hospital in the last four years there have been one hundred and thirty-six cases, exclusive of thirty-one of my own. The greater number of these in the practice of my colleagues I examined myself. In a total of one hundred and thirty-two operations there were one hundred recoveries and thirty-two deaths.

Even with this large experience I still feel in grave doubt as to the proper treatment of certain cases. Many of my colleagues with large experience have expressed misgivings as to many questions that have arisen from time to time, as new or unusual conditions have appeared.

The most positive assertions in connection with the treatment of appendicitis have been made, as a rule, by those with the most limited experience. In my first paper upon this subject, published in the *Boston Medical and Surgical Journal* of January 19, 1888, I drew five conclusions from the five cases I had seen up to that date. To one or two of these I still adhere; the others have been long since shown to be unsound. My present views upon this subject will undoubtedly change in time. Their only claim for attention rests upon the large experience from which they have been drawn.

This uncertainty which I feel in the management of the gravest forms of appendicitis; the large death-rate, not only in my practice but in that of my associates; the great prevalence of this disease, and the numerous cases that, unrecognized, are left to die unrelieved—these are my reasons for presenting a few remarks upon one of the most important questions which have arisen in the past few years.

There is a group of cases in which there can be, at the present time, little or no discussion as to the advisability of interference. I refer to the cases of localized peritonitis—where drainage is acknowledged to be the proper treatment by universal consent. But even in this procedure there has been, and is, a difference of opinion as to the advisability of separating the adhesions and removing the appendix.

In those mild cases where the constitutional and local symptoms are trivial, a great difference of opinion exists as to the wisdom of interference. In the severe types of inflammation, where there is a considerable extravasation, and where the constitutional and local signs are marked, there is little to be said at the present time against immediate surgical interference. But even in these cases the attending physician is not always familiar with those conditions in which a grave prognosis would be given by an experienced man. Cases have come to my notice—as will be seen by a glance at the tabulated cases—in which the favorable moment for operation has passed, and in which an operation has been performed in the presence of a general peritoneal infection. The group of symptoms by which we may recognize this impending danger is still to be accurately described. I do not mean to say that it ever is possible for a man who has seen but few of these cases to make his own diagnosis and prognosis from any written description—for it is only by long experience that one is able to give a probable prognosis in any case—but an analysis of a great number of cases, and continued discussion on this subject should enable the general practitioner to recognize at least those conditions in which the services of an expert should be sought.

I am firmly convinced that appendicitis is the most important acute abdominal disease of the present time, and that excluding certain zymotic diseases it is the cause of more deaths than any other acute

abdominal lesion. It has been said by some that deaths from peritonitis after operations for perforative appendicitis have been due to the operation itself. While I have no doubt that peritonitis has resulted and death has followed in cases which, if left to themselves, would have got well, still these instances are extremely rare. On the other hand, the number of deaths from this disease if left to itself has been and always will be deplorable. Moreover, the number of deaths from appendicitis is much greater than we suppose; for there is no doubt whatever that many deaths caused by appendicitis are ascribed to other lesions—especially to typhoid fever. Since May 1st I have known of at least twenty deaths from appendicitis in the practice of various men in this community. That the fatal result has not been due to the operation itself in all these instances is shown by the fact that in many of them no surgical interference whatever was made, while at every operation a general peritoneal infection has been found.

The number of deaths from appendicitis in which the true cause is not even suspected is, I have no doubt, very large. We have no accurate means of ascertaining the number of these deaths. If we take the returns, however, and select those cases where death has been caused, in males under forty, by "inflammation of the bowels," we shall get an approximate estimate of the number of deaths from this disease. "Inflammation of the bowels," I hardly need say, in males under the age of thirty or forty, is almost invariably caused by appendicitis. The statistics which I have gathered in my own practice in acute abdominal surgery show that in an enormous percentage of cases in males the cause lies in the vermiform appendix. Ten per cent. would be a large estimate for all other causes of peritonitis. In the city of Lowell, in the year 1892, Dr. Gage's examination of the returns shows twenty-seven deaths from "inflammation of the bowels" in young males. In the year 1880 there were in the city of Boston 40 deaths from inflammation of the bowels in males. In 1881, 41; in 1882, 40; in 1883, 43; in 1884, 54. In five years, therefore, in the city of Boston we have, presumably, deducting ten per cent. for other causes, 194 deaths from appendicitis in the years in which few operations were performed.

I need hardly emphasize better the importance of this subject than by calling attention to the great number of deaths from this disease—deaths most of which, I have no doubt, could have been averted even by our present imperfect methods of diagnosis and operation.

Diagnosis.—The diagnosis of appendicitis has been considered easy, but in my experience it is at times impossible to discriminate between this disease and certain others, though the history, with the local signs, is sufficient to make a diagnosis in the majority of cases. With very rare exceptions, a diseased appendix is the cause of all peritonitis, local or general, occurring in males. In children who are not able to describe

their symptoms the condition may apparently be abdominal when really due to lesions in distant parts. Errors are more likely to arise where symptoms of intestinal obstruction are present early in the disease. In some instances the septic extravasation is so rapid that inhibition of peristalsis is one of the earliest symptoms. A general peritonitis, associated with obstipation, with distention and absence of physical signs, cannot be clearly distinguished from certain other forms of acute obstruction. The rarity of the latter conditions enables us to rule them out on the chances. The indications for interference, however, in all these lesions are clear, so that an early exploratory operation will be on the safe side.

On the other hand, when the symptoms point to any one of the rarer lesions—like intussusception, volvulus, or internal strangulation—the possibility of an appendicitis must always be borne in mind. Not infrequently I have found a gangrenous appendix in cases where a diagnosis of internal strangulation had been made by the most experienced men. In one case in particular, the pain and local signs were all situated between the umbilicus and the spleen. Nothing was found in this region at the operation but purple and distended coils of small intestine. Death took place in a few hours. At the autopsy, in the diagonally opposite quadrant the appendix was found perforated and gangrenous —the source of the whole trouble. In all cases of general peritoneal infection, in which the lesion is obscure, the possibility of an appendicitis must always be borne in mind.

The prominent symptoms of appendicitis, when occurring singly, may be due to other causes than a perforation of the appendix.

Pain.—Sudden acute pain is common to all acute abdominal conditions, including hemorrhage. Pain associated with constitutional disturbances, rise of temperature and pulse—even if the site of the pain is remote from the appendix—is usually due to an affection of this organ. Pain considered alone very frequently has no direct relation with the usual anatomical seat of the appendix. In most of the cases where the diagnosis is beyond question, as shown either by autopsy or by operation, the initial pain is in the epigastrium, or is an indefinite pain "through the bowels," "all over the bowels," "in the lower part of the bowels," "in the stomach," or "in the bladder." The explanation of this phenomenon lies probably in the close nerve relations throughout the abdominal cavity—in the intimate network of the sympathetic system. In making a diagnosis, therefore, the seat of the pain in the first hours of an appendicitis is of no great importance. As the case progresses, however, the pain usually becomes localized in whatever region the appendix may occupy; but even this statement has exceptions. At times the pain is referred to remote regions throughout the whole course of the affection. The character of the pain may range from a slight discomfort to an agony, in which

the patient writhes in the greatest distress. In long-continued cases the pain may subside and become an unimportant feature of the disease.

TENDERNESS.—Tenderness is a more important symptom for diagnosis than pain, inasmuch as this symptom is usually placed directly over the lesion. Even in a general peritonitis the tenderness is more marked over the appendix than anywhere else. Tenderness may be exquisite or it may be elicited only by deep pressure.

One must be on the lookout for error in estimating the importance of this symptom. In this respect the attending physician, who has had a long and intimate knowledge of the patient, is better able to judge than one who sees the case for the first time. Some patients make much of pain and of tenderness, while others make very little of it; a casual observer may be deceived where a constant attendant will not. In practice, however, it is seldom difficult to estimate with sufficient accuracy the value of this symptom.

VOMITING.—In almost all cases of appendicitis—whether of the mild or of the severe type—vomiting soon follows the onset of pain. If the other symptoms subside, or if the peritonitis becomes distinctly localized, vomiting soon subsides. In unfavorable cases, where the peritonitis soon becomes general, vomiting—at first of the normal contents of the stomach, later of bile, and finally of the contents of the small intestine—is a continuous symptom until death, which often takes place in the midst of an attack. If the vomitus is not distinctly stercoraceous in fulminating cases, it soon becomes of coffee-ground color. The existence of this symptom I look upon as a very serious matter. As a rule, when there is constant regurgitation of dark coffee-colored fluid, the prognosis is unfavorable. The septic nature of the vomitus must also be taken into account where anæsthesia is used, because in several cases a fatal septic pneumonia has followed, or a septic bronchitis has complicated an otherwise favorable course.

The material found in the peritoneal cavity is often, in general appearance, precisely like that vomited in advanced peritonitis—thin and dark in color.

DIARRHŒA.—A large number of cases are accompanied in the first hours of the attack by more or less diarrhœa. In some the diarrhœa precedes the attack. In the latter instances the inflammation of the appendix very probably starts in an extension of the catarrhal processes from the cæcum. In most cases, however, perforation takes place at the very outset, without any premonitory symptoms whatever.

TIME OF PERFORATION.—In many of the articles which have appeared in the last few years upon appendicitis, much attention has been paid to the time of perforation. We are advised to watch for symptoms of perforation, which is liable to occur on the fourth, fifth, or sixth days, or later. I must state here, most unequivocally, my conviction that in all

severe cases of appendicitis—and in fact in all cases where there is a localized peritonitis—there is a larger or smaller perforation, with extravasation. The first symptoms in severe cases of appendicitis depend upon a perforation, and not upon a catarrhal or an ulcerative process in the interior of the appendix. This fact is proved conclusively to my mind by the fact that in severe cases, marked by the onset of sudden acute pain, the appendix, when found, *has always been perforated.* In almost all cases the pain is caused by an extravasation of the intestinal contents. Vomiting is reflex, caused either by the pain or by the immediate absorption of the extravasated material by the peritoneum. Finally, in all severe cases of acute appendicitis, with localized or general peritonitis, seen immediately or within a few hours, I wish to repeat most emphatically my belief that perforation already exists, and that there is no question of waiting for perforation to take place on the third, fourth, fifth, or any other day.

Constitutional Symptoms.—*The pulse.* The quality and the rate of the pulse give us, in appendicitis, valuable information as to the patient's condition and as to the prognosis. Observations of the pulse, however, throw little light on the diagnosis. It is early affected in serious cases, and may rise from 75 to 115 or 120. A pulse of 120 or more is considered by some surgeons an absolute indication for operating. In my experience a pulse of 120 in an adult is a grave symptom as to prognosis—depending, as it does, upon a serious constitutional infection. Its value, however, varies with the extent of the general peritoneal infection.

Temperature. The temperature in this, as in other forms of peritonitis, has very little weight with me, both as to diagnosis and as to prognosis. In some cases of general peritonitis, where the prognosis is absolutely hopeless, the temperature curve by itself is in every way satisfactory. I have known patients to die with a falling curve, and others to get well after an evening temperature of 104° to 105° for days. I have discarded, therefore, almost entirely the temperature as a guide to prognosis. It is an aid to diagnosis, however; but too much stress must not be laid upon this symptom.

Respiration. The respiration usually throws little light upon the condition of the patient. It is generally accelerated to correspond somewhat with the pulse and temperature. A very rapid respiration, however, is always a grave symptom, unless it depends upon simple mechanical distention. Caused by septic absorption its existence is of the gravest import. In a certain percentage of cases it is due to some complication in the lungs.

Distention. A general distention of the abdomen may be due to constipation from the use of opium, or to the formation of gas. Where there is no inhibition of peristalsis, this condition gives rise to discomfort

only. The abdomen should be auscultated for evidence of intestinal action; for even in some cases of the greatest distention there is no paralysis of peristalsis. Very often a general peritonitis can be ruled out by this method, the distention being merely mechanical. Where the distention is due to profound septic infection, no sounds whatever will be heard on auscultation; and there will be not only a stasis of the intestinal action, but at times a serious interference with intestinal circulation. The changes in the intestines caused by interference with the portal circulation are very marked early in the course of a general infection. They do not appear in a post-mortem examination, and therefore come under observation only in the course of surgical manipulations. These changes have the same cause as intestinal paralysis, and appear coincident with the latter. I have had unusual opportunities in recent years to observe this phenomenon, not only in its earliest manifestations, but also in its full development. Within the past two weeks I have seen, in a case of incipient general peritonitis, the jejunum distended, dark red to purple, with the portal radicles dilated and black. In another case (internal strangulation) the whole small intestine was similarly changed. Its coils were heavy, lifeless, distended, and cyanotic. The portal tributaries were beautifully injected, dark, and prominent. In the former case, to my great surprise, recovery followed, while in the second death took place in a few hours.

The existence of distention dependent upon a local infection is of the gravest import. At times the heavy coils can be felt through the abdominal walls. In all such cases the possibility of a portal thrombosis must be considered. Whether due to portal thrombosis or to local infection, with simple paralysis of peristalsis, no symptom is more important in the diagnosis and prognosis of this disease than a distended abdomen, accompanied by vomiting. Death almost always follows. Great care must be taken, therefore—as regards diagnosis, prognosis, and operation—to ascertain whether this distention is due to a septic infection, to a mechanical obstruction, or to simple constipation.

It is evident that the value of distention as a symptom depends upon its cause. In one or two abdominal cases I have been deceived, and have found, to my chagrin, that no serious condition, either of stasis or of mechanical obstruction, existed. Distention in connection with appendicitis, to be of any value from the diagnostic or prognostic standpoint, must be due to a general peritoneal infection. If due to any other cause its weight as an influencing symptom is almost entirely neutralized. For instance, I have observed time and again an uncomfortable distention after removal of the appendix in acute cases. Careful auscultation has shown the existence of peristalsis. At times the intestinal action has been strong enough to cause loud borborygmus. Such sounds are not only reassuring, but call for the exhibition of cathartics and the rectal

tube. Not that a general peritonitis may not be impending, for I have watched this symptom in doubtful cases, have noticed its gradual subsidence, and have seen develop the ominous signs of total intestinal inertia, and a complete inhibition of intestinal contraction, with an almost invariably fatal result.

Rectal and Bladder Symptoms.—Examination of the rectum should never be omitted. In those cases where the diseased appendix hangs over the brim of the pelvis we almost always get rectal tenderness. Moreover, the appendix, perforated and inflamed, in this position may give rise to frequent and painful micturition, to retention, or tenesmus. The absence of these symptoms, however, does not exclude appendicitis, for this organ may be situated in some of its unusual positions. In some cases pain in the bladder and frequent micturition have been almost the only symptoms.

Leucocytosis.—In my hospital cases the past summer, examinations of the blood have been made in every case by Dr. Richard Cabot. With one exception there has been a marked leucocytosis in all cases of perforation. So invariably accurate has this symptom been as an index of inflammation that in my last case I postponed operation twenty-four hours on account of its absence. An extensive general infection was present, nevertheless, and death took place a few hours after draining.

Anatomy.—I have very little to add to what has been written on the anatomy of the vermiform appendix. I have found it in the most unusual positions. The point of attachment to the cæcum is invariable—near the insertion of the small intestine, at the extremity of the well-marked line of longitudinal striations. In the greater number of cases the appendix lies at the brim of the pelvis, near the origin of the internal iliac artery. It may drop into the pelvis, or point to the left, or upward. It may be coiled upon the iliac fascia. More rarely it is placed behind the cæcum, with point upward or upward and outward. These variations depend upon the position of the tail of the organ, its base being fixed. At times, however, the cæcum itself is displaced, and with it there may be a very great variation from the usual position. For instance, I have found the cæcum and appendix in an omental hernia. I have seen the cæcum displaced upward, with the appendix on the liver. At times it is well over to the left.

Among the more unusual conditions I have twice seen the appendix in a pouch behind the cæcum, sheathed as it were in a pocket of peritoneum. Of all variations the commonest is the post-cæcal position, in which the appendix is practically extra-peritoneal. When my experience was very much more limited I looked upon this situation as one of great safety, on the ground that the natural obstacles to extravasation made the prognosis almost always favorable. I must now acknowledge this view to be erroneous. In many cases I have found

the appendix in this position, with an extensive gangrene of the post-cæcal tissues. Not infrequently the inflammation has broken through the natural boundaries and caused a general peritonitis. In severe cases the extravasations have followed up the colon and infected the surface of the liver, both inferior and superior, and in one instance have caused an empyema. The prognosis is, therefore, by no means necessarily favorable. Yet the obstacles to extravasation are greater than in the common positions. A perforation in such a position is marked by flank tenderness and dulness; the appendix usually presents itself, and can be more frequently removed without a general infection; moreover, walling off the peritoneal cavity when it must be opened is more feasible than in an appendix centrally located. The greatest evils have resulted from gangrene of the perinephritic tissues, extending under the liver and into the foramen of Winslow.

The question when to operate in appendicitis is the hardest one to decide.

Circumscribed Peritonitis and Abscess.—I think all will agree with me that cases of abscess should be opened and drained. Most surgeons believe that in cases of localized peritonitis no attempt should be made to separate the adhesions for the simple purpose of removing the appendix. I have no doubt whatever, from my own experience and from what I have seen of the work of my colleagues, that it is extremely dangerous to break down the barriers between an appendicular abscess and the rest of the peritoneal cavity. In some instances this must be done—drainage can be established in no other way.

A man with a limited experience in these cases may have had good luck every time he has found the general peritoneal cavity infected, and he may think the presence of septic fluids in the peritoneal cavity of little importance with proper cleansing and drainage. I have had at times case after case of recovery, even where there has been a total invasion of the peritoneal cavity. Then, under conditions precisely similar, where the infection has been no greater, where the patient's strength has been just as good, or even better, case after case has gone on to a general fatal peritonitis in spite of everything that I could do to prevent it. In these deplorable cases a fatal termination has taken place whether I have washed out with water or with an antiseptic solution, or whether I have confined my attempts to cleansing the peritoneal cavity by the use of dry gauze; whether salines have been used before the operation and after the operation, or both, or not at all; whether opium has been given or not; whether high rectal injections or low; whether gauze drainage alone, rubber drainage alone, or gauze and rubber drainage combined—whether any or all, or none, of these methods have been used, the same result has followed.

I am very much afraid of pus in the peritoneal cavity. It makes no

difference what the pus looks like, or where it comes from, its presence in the abdominal cavity is one of the gravest conditions that can possibly occur. In certain forms of inflammatory disease a rapid convalescence has followed, no matter how much soiling of the intestines there may have been. In other cases a septic instrument, a soiled finger, or a drop of such fluid as the uterine canal often contains is sufficient to start a fulminating and fatal peritonitis, and that in spite of all efforts to prevent such a result. In one of my cases I separated the firm adhesions about a perforated appendix, well shut off, and removed the appendix and omentum in a very rapid operation. There was very little shock. The patient died with a general infection in a very few hours. I have no doubt whatever that the method I used in this case was directly the cause of the fatal result, and I have never tried it since.

The objection to simple drainage, without the separation of adhesions, lies in the possible existence of other cavities. In certain forms of appendicitis I have observed pocket after pocket of pus in exploring the pelvis. These have been cases operated upon during the first three or four days—cases in which the symptoms have been grave from the outset, and in which there has been every reason to believe that there was a general infection. In cases where the adhesions are of a week or ten days' duration, I have generally found but one abscess cavity; I recall but two or three in which there was a second. If for no other reason, the low mortality in cases of circumscribed abscess, and the perfectly satisfactory permanent results that have followed simple incision and drainage, are sufficient grounds for limiting our operation to the cavity itself.

The Operation in Localized Abscesses.—In a localized peritonitis of appendicular origin, where there is an adhesion to the abdominal wall, the incision should be made through the most prominent part of the tumor. This will often be found tympanitic. With rare exceptions, this resonance is due to gas mixed with the contents of the abscess. Now and then, however, we shall find that the abscess is post-cæcal, and that the bowel lies between the collection of pus and the abdominal wall. In the former case, having reached pus, the abscess cavity should be thoroughly drained by means of rubber tubing and gauze. If the cavity is very large and extends into the flank, flank drainage also should be used. In a large number of cases the abscess will be found behind the cæcum—the appendix being situated in that position—and a single flank opening will suffice. In some cases of localized peritonitis the abscess cavity is so situated that it cannot be drained except among the healthy intestines. This complication has always seemed to me *à priori* a dangerous one. That there is danger in this method of drainage is borne out by my experience. Where it is possible to evacuate such cavities through the rectum or through the

vagina, I certainly believe that this is the best method to use. The dangers are undoubtedly less by this method than by up-hill drainage through the unaffected peritoneal cavity. Nevertheless, drainage through the rectum and vagina is very unsatisfactory, and I should not resort to this method unless the abscess was pointing unmistakably downward. Last year I treated two cases by rectal puncture. In both a satisfactory recovery followed. In one, however, another attack made a second operation necessary. The appendix was removed by Dr. Beach by the abdominal route. In this case there was a most satisfactory termination, the second operation being performed in a mild attack with comparative safety. In the great majority of cases--the appendicular abscess being unattached to the anterior or lateral abdominal wall—the abdominal route must be selected. Every effort must be directed against contaminating the healthy intestines any more than is absolutely necessary. An incision over the tumor, as far toward the flank as possible, should be made, and it should be long enough for free exposure of the tumor. Before an opening is made into it by separating the adhesions with the finger, the cavity should be walled off in all directions with gauze. Where the opening is in the median line, a very effectual barrier can be made by disposing the gauze in the form of a well. After thoroughly evacuating and washing out, a double rubber tube should be placed in the bottom of the cavity and gauze should be packed about it. The gauze barriers which have been soiled in the process of evacuation should be removed and replaced by clean gauze. In the great majority of my cases—whether of this variety or not—when it has been necessary to use gauze, I have taken that sterilized simply by heat. Iodoform gauze I have used very sparingly, chiefly on account of the danger of absorption. The prognosis in these cases is grave, but the mortality is much less than in cases where there is already a general infection.

Localized Peritonitis with Probable General Infection.—It is an entirely different matter in the first few days of a severe attack, where there is reason to believe that there is a general peritonitis, or the beginning of one. When the peritoneal cavity is opened, and when it contains a serum, clear or turbid; when the peritoneum is injected, though there is no intestinal paralysis, all adhesions about the appendix should be separated, the intestines irrigated or wiped, and every dependent part thoroughly drained. The prognosis in such cases is very grave, for an appendicitis of this variety is always associated with a beginning general infection. The reason for this is that in almost all cases of extensive extravasation through a perforated appendix the micro-organisms have very great virulence, and the colonies that must remain, even after the most thorough cleansing, exert so powerful an influence that the peritoneum cannot always overcome it.

It is in the treatment of an acute severe form of appendicitis that we

can lay down a definite rule, if we can in any form. In this variety—marked by sudden pain, vomiting, more or less distention, and high pulse, with a localized tenderness—the appendix, as I have already stated, is always perforated; and through the perforation the contents of the intestine may be escaping with such rapidity into the peritoneal cavity that no efforts of Nature can restrain them. Such cases should be operated on at the earliest possible moment, the earlier the better, just as soon as the gravity of the situation is realized. We shall be disappointed, however, in our results, even where a rule of this kind is followed, not only because we shall not be called early enough, but because there are instances in which a fatal extravasation takes place, not in a few days, or even in a few hours, but in a few moments after the giving way of the appendicular wall. The mortality in such cases must be about the same as the mortality in a single perforation from a gunshot wound in a healthy intestine. Eliminating the dangers from hemorrhage, the chances are very similar. No one would seriously maintain that in perforating gunshot wounds of the intestine, without hemorrhage, a low rate of mortality prevails even where the surgical relief is attempted almost immediately. Where the extravasation goes on three or four hours we must expect, in gunshot wounds, a very high death-rate from peritonitis. The same conditions are present in certain forms of appendicitis. The opening is as large or even larger, and the fecal escape as great or greater. I have operated within six hours of the very first symptom of a perforative appendicitis. One of the earliest operations in my list was performed at nine o'clock in the evening, the first pain having occurred at three o'clock that afternoon. The peritoneal cavity was apparently completely invaded by a thin fluid of distinctly fecal odor. On delivering the appendix, gas and fecal matter escaped from it with a noise before the ligature was applied. This condition had probably existed for several hours. In this case, after careful cleansing of the peritoneal cavity with gauze and draining with rubber tube, general peritonitis rapidly developed, and the child died in the course of thirty-six hours. In another case, after a mild attack of two days' duration, in which there was undoubtedly a slight extravasation from the appendix, a gangrenous opening of large size in an appendix of considerable lumen suddenly developed at half-past ten. The abdominal cavity was opened at one, and was found full of serum, from which I obtained pure cultures of the bacillus coli communis. The appendix was removed with the greatest ease, but the harm had already been done. This robust young man died in twenty-seven hours with a general peritonitis. These two cases are the earliest operations in my experience—one in six hours and a second in three hours after a rapid extravasation. I am convinced, therefore, that we cannot, even in the earliest operations, have invariable success. I fully believe, however, that we shall save a large

number of cases which, under dilatory tactics, we should lose, by opening the abdomen in all cases of more than moderate severity in the first few hours or days of an attack.

I have often seen a patient for the first time in the third, fourth, or fifth day of an attack of severe type in which Nature had succeeded in opposing an adhesive barrier to further extravasation. Under these conditions the most important and difficult question arises—whether to operate or not. I have considered this question many times. It is during these days—the third, fourth, and fifth, or later—that the early operation may be said in some cases to be too late. The extravasation from the perforated appendix has taken place; the harm from this extravasation has been done; Nature, in her own way, has successfully, thus far, opposed this extravasation. The adhesions are not strong, and in separating them we are almost sure to contaminate the rest of the peritoneal cavity. It seems to me—though I am by no means convinced of the truth of this assertion—that there are instances in which we see the case too late for the early operation, and too early for a safe late operation; that if we operate we undo the work that has thus far been successfully accomplished by Nature, and that we convert a case that is doing well into a case of fatal general peritonitis. This is one of the most important questions in connection with the discussion of this disease. I do not mean to assert that interference in a localized peritonitis on the third, fourth, or fifth day is inadvisable. I have operated many times at this period. I have done so, however, with the greatest care not to break down the recent adhesions. There is no more difficult operation in surgery than that of removing an appendix at this stage without infecting the general peritoneal cavity. I do not mean to assert that, on the third, fourth, or fifth day, in a case that is getting on well, with a localized abscess, we should delay; but the reasons I have given must appeal to one who dreads the presence of infecting material in the peritoneal cavity. The objection to leaving to itself a case in which presumably the adhesions are not strong is the giving way of these barriers under pressure and a consequent fatal extravasation. That this danger is by no means slight is seen in the constant occurrence of a general peritonitis in cases that are apparently doing well. Where the symptoms of general peritoneal infection appear suddenly, in the course of a localized peritonitis, several hours at least must elapse before the surgeon can attempt to repair the mischief. Where the adhesions are broken down by the operation these efforts to cleanse the peritoneal cavity can, of course, be made at once.

Relapsing or Recurring Appendicitis.—Where an appendix, unperforated, is removed in a period of health the mortality is very small. In my experience, which is limited in this class of cases, there has been no death. From the cases collected by Bull it would appear

that the mortality is perhaps two per cent. Taking all the cases together, however, I believe that we shall find the general mortality in the hands of all surgeons to be more than this. There are isolated and unreported cases—of which I am personally aware of one—in which death has taken place. Nevertheless, I believe that the operation should be advised and performed in all cases where, from frequent attacks, we are able to infer that there is chronic trouble. The operation in these cases should be performed by as short an incision in the right linea semilunaris as is adequate. Where the appendix is not adherent and the cæcum is movable, the operation may be performed through a very small incision. If there are many adhesions to be broken up, or if the appendix is not easily delivered, a longer incision must be made. In many cases a cuff of peritoneum can be made by a circular incision about the base of the appendix. This cuff should be turned back and the body of the appendix tied with silk. The cuff of peritoneum can then be turned forward and united in the Lembert method with fine silk sutures over the stump. I think it is a good plan to cauterize the base of the appendix before covering it in. The abdominal wound may then be united. In one case where the appendix was removed after recovery from an acute attack, I found a small collection of foul pus, by which the adjacent coils were presumably infected. In this case I left the wound open, with gauze drainage. A slow recovery followed. In similar cases I think it is always best to use drainage.

The Operation in Acute Appendicitis with a General Infection.—In these cases, as soon as the peritoneal cavity is opened, the turbid serum which it contains should be evacuated, as well as possible, by means of dry, sterile gauze. This should be done before search is made for the appendix. The incision in such cases should be made over the usual seat of the appendix, beginning near the pubes and extending upward and outward parallel with the fibres of the external oblique, and should be long enough to permit free exposure and manipulation of the parts. Having dried the pelvis and presenting intestines as well as possible with gauze, fresh pieces should be placed backward, upward, and toward the median line as a barrier against renewed infection. The appendix should now be sought. In a large proportion of cases considerable thin fecal fluid will be found, more or less confined to the immediate vicinity of the appendix. This should be removed by separating the adhesions about the appendix, irrigating and wiping, care being taken that the irrigating fluid shall escape from the wound without any impediment whatsoever. If the intestines get in the way and prevent the easy return of the fluid, we may be spreading in all directions fresh quantities of septic material and making matters worse than they were before. Having separated all the adhesions in the pelvis or wherever the appendix may be situated, pieces of dry gauze

should be packed into the dependent places and removed as soon as they become saturated. As soon as the parts are dry the appendix may be delivered and tied off. After a final cleansing and drying a double rubber drainage-tube should be placed at the most dependent portion of the cavity, and about this gauze should be lightly packed. Strands of gauze should also be placed upward toward the umbilicus and toward the right flank. In many instances it is of great advantage to make an opening in the right flank and to apply a gauze wick here also. A dry absorbent dressing should be placed over the whole. In a large proportion of cases, even where the general peritoneal cavity has become infected, this procedure will be followed by very satisfactory drainage, and the patient will recover. Unfortunately in many instances this effort will prove futile.

In some cases of general peritonitis the patient's condition is too bad for anything more than a simple incision with drainage. Search for the appendix cannot be made without adding so much to the shock that death may take place on the table. It is a question whether in cases of this kind operative interference is not to be condemned. The patient is on the verge of death, and the slightest manipulation will be surely fatal. The slight shock from anæsthesia even may be sufficient to produce death where no operation whatever is performed. The only chance for recovery in cases of this kind lies in leaving the patient to Nature. I have never seen a recovery under these circumstances, but I have known one patient to get well, though apparently moribund after operation for an incipient general infection. Statistics show that in very rare instances recovery may follow, even in advanced cases of general peritonitis.

In some instances death is clearly impending. I was once persuaded to operate on a moribund patient. The family were assured that the patient would die under ether. After a few breaths of ether he did die. I think it was a mistake to undertake an operation in this case, for surgical interference is unjustifiable in the face of certain death, even when it is insisted upon by the family.

Treatment of Distention.—One would infer from what is being said daily that nothing more is necessary in the obstipation of a general peritonitis than the free use of salines. In a general peritoneal infection, beyond the very earliest stage, medicinal treatment has no effect whatever. Salts, even if retained in the stomach by the most violent effort of will, produce no effect. Peristalsis, inhibited by septic influences, has an additional burden to overcome in excessive distention, for the power to contract may be neutralized completely by the latter condition. The question arises whether in desperate cases it is not advisable to incise the distended coil and let the accumulated gases escape. In one instance this procedure, practised by Dr. Warren, was followed by immediate

relief and ultimate recovery. It is quite likely that occasionally this method may turn the scale. The use of salines, in my experience, has been worse than useless under these conditions, for not only has there been no intestinal action, but the patient has been excessively weakened by vomiting or by violent efforts of will to retain the nauseating solutions.

THE USE OF SALINES IN APPENDICITIS.—In the mild form of appendicitis, the so-called catarrhal variety, in appendicular colics, and even in slight extravasations with localized peritonitis, salines or other cathartics may be given with safety in the majority of cases, not only in the early stages, but throughout the disease. Mild cases, however, do not require the use of cathartics; they do just as well under the opium treatment, or under no treatment at all. There is danger that occasionally a mild case may become a fulminating one. In the latter condition, and in all cases marked by sudden violent onset, salines or other cathartics should not be used under any circumstances whatsoever. I have no doubt whatever that the exhibition of salines will cause, in many such instances, renewed and fatal extravasations. Not only are the contents of the intestines liquefied by the use of saline cathartics, but intestinal contractions are stimulated, and if we have a considerable perforation in an appendix of large calibre, there is nothing whatever to prevent an extravasation extensive enough to infect the whole peritoneal cavity in a very few minutes. I have seen these extravasations taking place in the abdominal cavity time and again, and I have found not only the general peritoneal cavity everywhere invaded by thin fecal matter, but I have seen it pouring out of the perforated appendix. I therefore believe that cathartics should never be used in the beginning of an attack of appendicitis—that the use of opium is far more rational if anything must be used.

It is a different matter when the appendix has been removed after tying its base, or when, having drained a localized peritonitis, gauze barriers have been arranged against further extravasation; or when the disease has been going on long enough to make the adhesions strong. But not always in cases where presumably there are adhesions is it best to give cathartics until after the operation. Up to the first four or five days the adhesions which confine the septic material in a localized peritonitis are not strong, and increased pressure through the appendix caused by stimulated peristalsis may, and frequently does, rupture these adhesions and cause immediately a fatal peritonitis.

The theory of intestinal drainage seems to me a good one. I always feel encouraged when after abdominal operations the bowels begin to move freely; but in mild cases there is no danger from septic absorption, and therefore no occasion for catharsis. In general infections with an open appendix, no amount of intestinal drainage can get rid of the ex-

travasated material, and cathartics are worse than useless. In localized peritonitis there is no immediate danger from septic absorption, there is plenty of time for surgical drainage, and cathartics may rupture the recent adhesions. Finally, with the intestinal canal intact, free catharsis is very desirable, though certain salines cause exhausting vomiting and are often ineffectual.

Pathological Considerations.—In every case of localized abscess that I have seen there has been a very offensive odor to the pus. In many cases the abscess cavity contains gas, either intimately mixed with pus or in large bubbles. The odor may be fecal, or its quality may be that of simple decomposition. At times the odor has been very peculiar —difficult to describe, but extremely nauseating and offensive. The odor indicates an intestinal origin, or at least contamination.

In many of the cases that I have included under the heading *Appendicitis* there has been no absolute demonstration of the appendicular source. The diagnosis rests upon the facts, first, that in every case where I have been able to find the source of infection it has been in the vermiform appendix, with one possible exception; and, secondly, that even where I have not demonstrated a diseased appendix, I have found no other pathological explanation. In the exceptional instance referred to the tip of the appendix was gangrenous. Drs. Fitz and Councilman thought, however, that the infection of the appendix was secondary to the abscess, and that the abscess was the result of a pylephlebitis.

Some writers refer to a gangrene of the cæcum as complicating appendicitis in its acute stages. If such a condition exists, it seems to me very extraordinary that I have never observed it. I have often seen extensive gray deposits of lymph on the intestinal wall. These masses are always present in an appendicitis with perforation. But the intestinal wall under them is not affected so as to be weakened. In this deposit will be found great numbers of micro-organisms. The gross appearances in a localized peritonitis in its early stages are precisely like those of a general peritonitis as regards the deposits of lymph in more or less extensive gray patches. There is no reason why a necrosis of the intestinal wall should not take place; but so far as I have been able to observe, and so far as I have been able to learn, this gangrenous process very seldom occurs. In fact I have never seen perforations of the intestine with extravasation, from any other causes than gunshot wounds, stabs, ulcerations, strangulations, etc., except in those very rare instances where a large appendicular abscess has broken into the intestine. The question of resecting the intestine, therefore, for acute gangrene in the course of an acute appendicitis seems to me so remote that we need give it very little attention. It is, however, sometimes necessary to resect and suture the intestine in extensive fecal fistulæ resulting from a rupture of the abscess into the cæcum. Even in these cases it is much better to wait

until Nature has closed the opening as far as she is able. In one instance the whole contents of the intestines were evacuated for some weeks through the stump of a perforated appendix. There was some mechanical obstruction low down, probably from inflammatory pressure, and this spontaneous outlet undoubtedly saved the patient's life. I fully expected to be obliged to resect, but in two or three months the fistula closed entirely and the intestinal functions were perfectly re-established. In no instance has there been a permanent intestinal fistula after any of my operations. I have resected the cæcum once or twice for long-continuing fistulæ where the abscess had been left to take care of itself and had perforated the intestinal as well as the abdominal walls. In these operations the prognosis is very good indeed.

I have observed great variations in the diseased appendix itself. In all cases of perforation, the appendix throughout is swollen and hard. The mesentery of the appendix shares in the inflammatory infiltration. In many instances the mesentery is covered with the gray exudation alluded to above. In all, almost without exception, the mesentery is friable, and the ligature must be placed with great care so as not to cut through the vessels entirely. The appendix itself, though more friable than in a normal condition, is never so brittle as to be easily torn. In explorations with the finger, there is usually no difficulty whatever in recognizing the diseased appendix.

Unless there have been one or more previous attacks of localized peritonitis, the appendix, even in the second week of the disease, is bound to the surrounding parts by very easily separated adhesions. The strength of these adhesions, however, varies; and the experienced finger can tell with reasonable accuracy how much force it is safe to use in their separation. Yet in many instances it is impossible, even with the greatest care, to avoid infecting the general peritoneal cavity.

The appendix may become perforated at any point between the tip and the base. I have found the perforation quite as frequently at one point as at another. The perforation takes place, as a rule, where the concretion lies; and the concretion may be formed anywhere.

In my cases, almost without exception, there has been a fecal concretion in the appendix or in the abscess cavity. This body may be no larger than a grape-seed, or it may be as large as a small olive; it may be round or oblong, or more rarely, somewhat irregular. It is so soft that it may be crushed between the thumb and finger. The surface is generally smooth. It always lies directly under the perforation in a necrotic pocket. There may be more than one stone: in some instances I have found two or three. In such cases there is usually but one perforation. Where the appendix is not entirely removed the other stones may give rise to subsequent trouble, although this accident must be very rare. I have never found a grape or other large seed, but in

one instance the stone seemed to contain a large number of very minute seeds.

Importance of Bacteriological Examinations.—Early in my experience of abdominal work I observed that certain cases did badly. It was hard to tell the reason for this. A fatal peritonitis would follow an operation in which I could recall no error in antiseptic technique. In all such cases the operation was a hysterectomy. In almost no clean operations did any such misfortunes occur. For instance, no deaths in clean ovariotomies have occurred in my practice since my first two operations in 1885. The only source of infection in cases of peritonitis following hysterectomy has been the uterine canal. In all these hysterectomies the extra-peritoneal method of treating the stump was used. In cases of appendicitis precisely alike, I have observed that one patient would get well and the other would die, acute general peritonitis always proving the cause of death. No bacteriological examinations have been made in my septic abdominal cases until this year. Of late, in as many cases as possible I have made cultures, at the time of the operation, of the abdominal fluids—of the clear or turbid serum, of the contents of the excised appendix, and of the pus of the appendicular abscess. The results already attained throw a great deal of light upon the cause of death in many instances. In most septic serous effusions into the peritoneal cavity, pure cultures of the bacillus coli communis have been found. This micro-organism, however, is not present in all cases. It has been found frequently enough in rapidly fatal peritonitis to justify the prediction of Dr. Roswell Park in regard to this organism, in his paper before the American Surgical Association last June. The presence of this bacillus will probably explain the rapidly fatal character of certain forms of appendicitis. I have found it also in one or two instances of localized peritonitis. I have failed to find it in a number of cases of circumscribed abscess of a few weeks' duration. The importance of a careful bacteriological examination in all cases of appendicitis cannot, in my opinion, be overestimated. This is true not only of the cases of perforation, but of those mild relapsing or recurring cases in which the walls of the appendix have not been perforated.

Prognosis.—The prognosis in cases of appendicitis depends entirely upon the variety. In the mild cases, with one or two exceptions, recovery without operation has taken place. In none of them was an operation seriously considered. Not that an operation in these cases is unjustifiable, for one can bring forward many strong arguments in favor of surgical interference.

The prognosis in cases of localized peritonitis is almost invariably good. In my list recovery has followed in almost every instance. I may say that recovery has been invariable where the operation has been limited to simple evacuation, unless an incipient general peri-

tonitis existed at the time. Two or three deaths have taken place in cases where the prognosis seemed to be very favorable. But even in these cases the constitutional symptoms were severe, and although there were no symptoms of a general infection present at the time of the operation, I have no doubt that this condition had already begun. The prognosis where appendicular abscesses have been opened and drained is good. The recoveries have been permanent, with the exception of one case drained by the rectum, and another drained in the right iliac fossa. There have been renewed attacks in one in which Dr. Beach successfully removed the appendix; in the other there has been a second attack, and the man is now prepared for an excision during the interval. In the case drained by rectum the chances are that there was no closure of the wound by granulation from the bottom, as in healing by the abdominal route.

In cases of well-established general peritonitis, where there is a severe constitutional infection, where the intestines are paralyzed by the local poison, the prognosis is invariably hopeless. I have never seen—so far as I am now able to recall the facts—a recovery in any case of fully established general peritonitis, marked by obstipation, vomiting, and general septicæmia.

The case is quite different where we operate at the beginning of a general infection. Little could have been known of the appearances of the abdominal cavity at this stage of a general infection up to the agitation of this subject in the last few years, simply because operations were very rarely performed for any reason at this stage. The rule previous to the last few years was to wait, in all such cases, until the symptoms became so grave that the most conservative were willing to admit the necessity of interference. In the first stages of a general peritoneal infection from perforation of the appendix, there is little change in the gross appearance of the peritoneum. It may not even be injected. The intestines will be found bathed in a serous effusion in the very earliest stage—the effusion becoming turbid in a few hours. There may not even be an odor to this serous effusion. In the course of a few hours this thin fluid becomes more and more turbid, though it is always thin. If the patient lives long enough, it will become decidedly purulent in general appearance; the peritoneum in a very short time will become injected, and the characteristic appearances so common at post-mortem examinations develop. Cultures taken from the fluid in the first hours of a general infection grow rapidly and contain different forms of microorganisms. In the most virulent cases which I have seen, where I have been able to take cultures, the bacillus coli communis plays the most important rôle. In several instances, nothing has been obtained but pure cultures of this germ. Whether the prognosis is invariably bad in the presence of the colon bacillus cannot as yet be said. There have

been no recoveries in the few cases in which I have obtained this culture from a fluid that has invaded the whole peritoneal cavity. In a localized peritonitis several cases have recovered in which this micro-organism was cultivated with several forms of pyogenic staphylococci.

I have had many recoveries where there has been a beginning general infection, but it is impossible to give a definite prognosis from the gross appearances, or from any information that we can obtain with our present knowledge of the subject. In two cases, apparently exactly alike, death will follow in the one and recovery in the other.

The prognosis in operations for the removal of the appendix in the interval, with or without adhesions, is very good indeed. I do not believe that the mortality will exceed five per cent., and probably it will be less than that.

Prognosis Affected by Previous Severe Attacks.—Where there has been a serious attack of appendicitis, with an extensive localized peritonitis, or in those rare cases where recovery has followed a general peritonitis, a subsequent sudden perforation has been followed in several instances by the most rapidly fatal result. I have been interested in trying to account for this fact. In my early experience with appendicitis it seemed to me that an attack of extensive localized peritonitis would be an effectual barrier against a second extravasation. While this may be true in many cases, yet not infrequently I have observed that a previous inflammation has so changed the character of the peritoneum that it has lost its power of rapid adhesion-formation; hence, when a second attack by necrosis has broken through the appendix and its pathological barriers, the peritoneum shows no power whatever of restraining the extravasation. In such cases the peritonitis has been fulminating and most rapidly fatal.

After-effects of Appendicitis.—It is as yet too soon to ascertain the number of cases of relapsing or recurring appendicitis where I have advised no operation. The number that has come under my observation is very small. After excision of the appendix itself there has been no subsequent trouble whatever. In the cases of circumscribed abscess treated by drainage, without removal of the appendix, there has been subsequent trouble in not more than two instances. All fecal fistulæ, of which there have been many cases, have ultimately healed. The most unpleasant symptom in those cases treated by drainage has been a ventral hernia. In my early experience I supposed that the extensive adhesions formed among the intestines near the wound, with the closure of the cavity by granulations, would make a scar that could never result in hernia; but I have found that the scar tissue early becomes relaxed, and that an eventual giving way is by no means uncommon. Unfortunately there is no means of preventing this occurrence, and a subsequent operation is necessary.

STATISTICS.—In the following statistics I have considered all my cases in which the question of appendicitis has been raised. I have not included those I have seen in consultation with my colleagues. The first ninety-three have been published in more or less detail in the *Boston Medical and Surgical Journal.*

In many of the mild cases the diagnosis seemed sufficiently clear. Though some of them possibly were not appendicitis, the symptoms were sufficiently suggestive of that disease to raise the question of surgical interference. The most significant column is that containing the fatal cases in which no attempt could be made to save the patient. This list would have been much longer had I refused to interfere where death followed an operation performed as a forlorn hope. I have added the results in eight cases supposed to be appendicitis, but where some other acute lesion was found.

Of 181 cases, 130 were males and 51 females. The ages were:

MALES.		FEMALES.	
Between the ages of—		Between the ages of—	
1 to 10	6	1 to 10	6
10 " 20	39	10 " 20	10
20 " 30	38	20 " 30	7
30 " 40	19	30 " 40	11
40 " 50	10	40 " 50	5
50 " 60	10	50 " 60	5
60 " 70	1	70 " 80	2
Age not given	7	Age not given	5
	130		51

In 181 cases there has been a history of previous attacks in 46—one attack in 22 cases, two attacks in 5, three or more attacks in 19, and the number of attacks not given in 12 cases.

The number of operations followed by death in which the general peritoneal cavity was found infected at the time of operation was 24. In 1 case death followed from general peritonitis where a circumscribed abscess was carefully opened and drained, with no apparent general infection. Once death followed from general peritonitis after separating the firm adhesions of a circumscribed abscess. In 2 cases the patient died, some weeks after a successful drainage, with general peritoneal infection from a second abscess. In 3 a fatal general peritonitis followed drainage among the healthy intestines. In 1 of these the abscess probably resulted from pylephlebitis, though the appendix was gangrenous.

In acute cases with operation and recovery there was a general peritoneal infection in nine cases; in drainage of abscesses the general cavity was infected more or less in 10; in 39 cases the general cavity of the abdomen was not opened.

In the whole number of 181 cases there were 43 deaths—a mortality of 24.3 per cent. In 107 operations there were 30 deaths—a mortality

of 28 per cent. The number of operations where there was a general peritoneal infection more or less fully developed was 32; the number of recoveries was 9—a mortality of 75 per cent.

In practically all the fatal cases general peritonitis was the cause of death. The severity of the cases is well shown by the fact that death followed in most instances in a few hours. Life was rarely prolonged over forty-eight hours.

With one or two exceptions, the operation was performed immediately. Where I advised delay I was obliged to operate subsequently in two or three instances. In but one of these cases was death due to this delay; in the others a fatal general peritonitis was caused by the unavoidable infection of the general peritoneal cavity at the time of the operation. This infection would have taken place just the same at an earlier date, for both were circumscribed abscesses so situated that extra-peritoneal drainage was impossible.

In addition to the 181 cases of appendicitis, I have been called to eight patients in which it seemed probable that there was an appendicitis. In 2 there was an acute obstruction from a band; in 2 malignant disease was found; in a fifth there was general peritonitis from gonorrhœal infection; 2 were acute obstructions from omphalo-mesenteric bands; in 1, operated upon by a colleague, the appendix was unaffected. Of the 8, 2 recovered—the unaffected appendix and 1 case of omphalo-mesenteric bands. Temporary recovery took place in 1 of the malignant cases. The others all died.

SUMMARY.

	Recovered.	Died.	Total.
Chronic cases, operation	15	...	15
" " no operation	8	1	9
Acute cases, no operation	50	12	62
" " operation	58	30	88
Recurrent cases, operation	4	...	4
" " no operation	2	...	2
Appendicitis operated upon for acute obstruction	...	1	1
	137	44	181
Acute abdominal lesions mistaken for appendicitis	3	5	8
	140	49	189

ON THE NEUROSIS FOLLOWING ENTERIC FEVER KNOWN AS "THE TYPHOID SPINE."

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IN 1889 Dr. Gibney, of New York, described at the American Orthopædic Association a sequela of enteric fever which he called "the typhoid spine," and which he regarded as a perispondylitis—"meaning an acute inflammation of the periosteum and the fibrous structures

which hold the spinal column together." He stated that his reason for the use of the word was "the production of acute pain on the slightest movement, whether lateral or forward, and the absence of any marked febrile disturbance or neuralgia." He described four cases.

In the first, a lad of fifteen years, toward the end of convalescence, complained of severe pain in the back, particularly in the lumbar region and especially after any movement. There was no disease of the bone; no pain in the distribution of the sciatic or anterior crural nerve. He was seen in the autumn of 1882 with Dr. Beverley Robinson. A spinal brace afforded relief, and in the course of two or three weeks he was practically well, but the brace was worn for more than a year.

The second case, a young man of twenty-four years, had an attack of typhoid fever, which ran a normal course. After convalescence was well established he complained of pain in the back, but he was able to be up and about, and played tennis. After a fall at tennis the pain became very severe, and he suffered so excruciatingly that he could only rest in a recumbent posture. Deep pressure over the iliac region on the left side and lateral or antero-posterior motion of the spine caused excessive pain. He had some fever. The symptoms persisted from the latter part of November until the beginning of January, but it was not until March that he was able to get about.

The third case, a lad of eighteen years, had typhoid fever in November, was convalescent by December 27th, and went to New York. On January 10th he fell while skating and struck his left hip. A week after this he had pain in the region of the lumbar spine. The stiffness became more marked and the pains increased in severity. On the 10th of February he went to bed and was seen by a surgeon in Albany, who regarded the case as one of psoas abscess. There was no fever, no evidence of disease of the spine, but the patient could not move without exquisite pain. He did not recover until May.

The fourth case seems to me to belong to an entirely different category, as it was an instance in which during typhoid fever a boy had kept both limbs flexed on the abdomen, and in convalescence was unable to straighten them—an event met with in many protracted illnesses in which the patient lies curled up in bed with the legs flexed.

In 1890, in a discussion at the Association of American Physicians following the reading of a paper "On Some Points in the Natural History of Enteric Fever," by Dr. James E. Reeves,[1] Dr. Loomis, Sr., referred to Dr. Gibney's observations and to one of the cases he had asked Dr. Gibney to see. Dr. Loomis knew of no reference in literature to a similar condition. Dr. Jacobi at the same meeting, besides protesting against the introduction of a new name, such as "typhoid spine," suggested that, in the absence of temperature, it might be one of two things, either a neurosis or a spondylitis, remarking that mild forms of spondylitis are not so uncommon as they are believed to be.

[1] Transactions of the Association of American Physicians, vol. v., 1890.

In the *American Text-book of Medicine* (page 90) Dr. Pepper remarks in the article on Typhoid Fever that he has observed in a series of cases "obstinate periostitis of the sternum or of the crests of the ilia, or in two instances, judging from the location of the pain and from the effect of movement of the trunk, of the front of the spinal column." Eskridge has also described a case.

I have not been able to find any other references in text-books or monographs on typhoid fever, either in English, French, or German. My attention had not been called to the condition until recently, unless perhaps a case which I saw several years ago with Dr. Grasett in Toronto was an illustration—a young officer, invalided from India after a prolonged fever, who had for many months attacks of the most severe pain in the back on the slightest movement, which incapacitated him completely; though when seen by me he looked strong and robust and had a good appetite. He subsequently got quite well.

The two following cases are, I think, illustrative of the condition which Dr. Gibney has described:

CASE I.—O. T., aged twenty-five years (hospital, No. 8201), admitted, complaining of pains in the back, hips, and stomach. The family history is good. His father and mother are living and well. One brother died of typhoid fever.

Patient was strong and well until July, 1892, when he had a very severe attack of typhoid fever with relapse. He was in bed for nearly three months; very slow convalescence. He remained well for three weeks; then the present illness began with pains in the back and hips, usually of a shooting character, and paroxysms of pain in the abdomen, of which he would sometimes have several in the day. He had to take again to his bed, and was there for seven weeks, having much pain in the lower part of the back and down the front of the legs. He never, apparently, from his account, had any paralysis. About June of this year he was well enough to go out and do light work about the farm. In the latter part of June he had another attack of severe pain in the back and abdomen. He had not to go to bed. There was much aching pain and shooting in the right leg from the hip down to the knee. In the latter part of July and in August he had severe attacks of diarrhœa. Since August he has been up and about, but not working, and has been able to go out shooting. At present he has slight pains at times in the back and in the legs, and yesterday there was an aching pain from the left knee to the ankle. The appetite is good. He never vomits, though he often has eructations. Bowels are costive. He sometimes has dyspnœa on exertion.

Present condition. Healthy-looking, well-nourished man, with fairly well developed muscles. He gives one the impression of a neurasthenic patient. Lips and mucous membrane of good color; tongue clean and moist; pupils equal; pulse, seventy to eighty; no increase in tension. Practically the examination of the thoracic and abdominal organs was negative. The abdomen was soft and nowhere tender. The chief complaint is of weakness in the back, and it hurts him to turn in bed. He describes the pain which he had last year as beginning in the small of

the back, passing round the hip-bones, and then up the back. Judging from the scarring of counter-irritation, the chief trouble was thought to be in the lower part of the spine. There is still a little tenderness on pressure just above the left sacro-iliac crest. Patient gets out of bed readily and stands well; walks with a natural gait; does not sway with the eyes shut. After prolonged standing or walking he complains of great increase of pain in the back. The knee-jerks are present, a little exaggerated; there is no ankle-clonus. The most careful examination of the spine fails to reveal any signs of organic disease. The urine is normal.

The patient remained in hospital a little more than a week, took large doses of nux vomica, and was encouraged to believe that he had no serious organic disease. Subsequent examinations gave no additional information, but the patient evidently was highly neurasthenic.

Case II.—A. A., aged twenty-one years, architect's assistant. Seen with Dr. King May 10, 1893. Patient has always been a healthy man, and has never had any very serious illness. He is not of a robust constitution and, though bright, not of a very strong mental fibre. There are no special nervous troubles in the family.

In November and December last patient had typhoid fever, an attack of moderate severity. On New Year's day he sat up for the first time, and convalescence was gradually established. There were no sequelæ, no complications, and early in February he went to his work. He gained in weight and looked very well. He remained at work about three weeks, complaining only at times of pain in the back and of being very tired after sitting for a long time. One day he was very much jarred in the back by a sudden jerking of the cable-car in which he was riding. Early in March, after complaining very much of his back and of the pain on moving, and of tired feelings, he took to his bed, where he has remained ever since. Dr. King tells me that the chief symptom has been pain on movement. His general health has been excellent. The appetite has been good, he has gained in weight, and he has slept well. He has been nervous and at times almost hysterical. When quiet and at rest and not attempting any movement he does not complain of pain; but on turning, or on attempting to get out of bed, or even the thought of moving the legs is enough to cause him to cry out. The pains have been in the lower part of the back, extending sometimes up the spine and down the back and sides, more rarely the front of the leg as far as the knee. He has no fever, no chills, but has sweated a good deal. He has had no swelling of the joints.

Present condition. Patient is a well-grown young man, well nourished, musculature of moderate development. The palms of the hands are moist and sweating, and he was somewhat excited, and at our entrance flushed over the cheeks and neck and upper part of the chest. Face does not indicate any special strength of character; rather the reverse. Pupils of medium size, equal, active; tongue clean. Patient was in the dorsal decubitus, his usual attitude. On pulling down the bedclothes he implored us not to touch him, as he was sure it would hurt him very much. The abdomen was full and natural-looking. On palpation he complained of a good deal of pain in the left iliac region; but on withdrawing his attention and pressing forcibly with the left hand in the region of the heart, and asking whether he had pain here, the right hand at the same time could be pressed deeply into the iliac

fossa without causing any disturbance. The deepest pressure in the lumbar and iliac regions failed to reveal any glandular enlargements or thickening. The inguinal glands were enlarged; no special sensitiveness along the anterior crural nerves. On asking him to lift the leg he said it was impossible, as it hurt him so much; but in a few moments, placing the hand beneath it, he lifted it apparently without pain. When lifted in a semi-flexed position he said it was impossible for him to straighten it; but in a few moments it could be readily straightened, and he straightened it easily on the bed. There was no special wasting of the legs. He could move all the muscles freely, and was able to get up and stand on his legs if he took time. The sensation was perfect; the knee-jerks present, perhaps a little exaggerated; no ankle-clonus. The feet and ankles were perspiring freely. No swelling of the articulations and no pain on pressure of the muscles or in the popliteal spaces.

On asking him to turn over on his left side he demurred very much, but gradually, and apparently with a great deal of difficulty, he got himself over. The legs could then be moved easily and freely; no pain about the hip-joints, and the legs could be flexed and extended readily. The spine was straight; the lower dorsal vertebræ a little prominent. No tenderness at any point along the spinal column. On both sides in the lower lumbar and sacral regions he was sensitive at a distance of an inch and a half or two inches from the middle line, and particularly toward the sacro-iliac synchondroses and along the posterior third of the crests of the ilia. He stated that these were really the points of greatest pain. On any attempt at twisting, the spinal column was very sensitive, and we could not induce him to sit up. In the attempts to make this movement he seemed to suffer a great deal of pain and began to cry.

There were no sensory changes, no hemianæsthesia, no hemianopsia. The patient said that his chief trouble was more the dread of moving, lest it should cause pain, than any pain itself. Four days ago he sat up for a couple of hours—got out of bed himself and sat on the chair—but felt very tired, and the back was painful. Practically the examination in this case revealed neither Pott's disease nor neuritis.

He was ordered massage and electricity and the Paquelin cautery to the back, given strychnine internally, and urged to sit up a definite time each day.

June 10*th*. A few days after I saw him he was able to sit up, and improved rapidly. Went out on the 30th of May and has been doing remarkably well ever since. Called to-day; looks in very good condition. No pain in the back; feels a little stiff; knee-jerks are normal; condition good.

Cases II. and III. in Dr. Gibney's paper are very much like the ones here mentioned, particularly in the fact that the symptoms developed after convalescence, and in both instances there was a slight trauma—in one a fall while playing tennis and in another a slight fall on the left hip while skating. In the case reported here the patient also lays a great deal of stress on the jar which he received by the sudden jerking of the cable-car. In both the prominent symptom was pain on movement, and there was an absence of all signs of organic disease.

An explanation of the symptoms in these cases is by no means easy. As already mentioned, Dr. Gibney regards the lesion as a perispondylitis, an acute inflammation of the periosteum and fibrous structures holding the spinal column together; and with this view, judging from the quotation made, Dr. Pepper seems to agree.

Joint and periosteal troubles are by no means rare sequences of typhoid fever, but the symptoms do not usually develop (as in three or four of the cases here described) at so long a time after convalescence has been well established. The periostitis, seen oftenest about the sternum and the ribs, proceeds, as a rule, but not necessarily, to suppuration. I have on several instances seen a periosteal swelling disappear without suppuration. We do not have, so far as I know, protracted periosteal thickening, lasting for weeks or months, without suppuration; and it is difficult to conceive of the attacks of pain, such as are described in the second and third cases of Dr. Gibney's and in the second case which I here report, lasting for months, due to a simple perispondylitis, which in none of the cases passed on to suppuration. The general impression given by the patients whom I saw was that they were neurasthenic, and while, of course, it would be very illogical to assume that all of the instances are due to the same cause, yet I cannot help feeling that many of them are examples simply of a painful neurosis, an exaggerated condition of what was formerly known as "spinal irritation," and analogous to the condition of "hysterical spine" and "railway spine," in which the patients suffer on the slightest movement of the back or of the legs. In the second case reported the whole behavior during the examination was that of an hysterical patient; thus, he could not think of lifting a leg—even the idea was enough to give him agonizing pain—and yet in a few minutes he lifted it himself as he got out of bed. So also the slightest pressure in the lumbar or iliac regions would cause him to scream out; but while his attention was diverted pressure could be made with the greatest facility. The rapid recovery in a few days, with disappearance of all the symptoms, is quite inconsistent with any chronic perispondylitis.

I have recently seen a case presenting somewhat different features, but which I think may also be reasonably classed as a post-typhoid neurosis:

Case III.—A. B., aged about thirty years, of New York City, consulted me October 2, 1893, stating that he had had trouble with his spinal cord. Family history was good; parents living; one sister, however, was insane.

He was nervous as a boy; used to tremble very much when excited, and had what he speaks of as nervous fits. He had gonorrhœa three or four times; never had lues; acknowledges excesses *in venere*. Takes alcohol, but is not a hard drinker.

September 23, 1891, he had an attack of typhoid fever of unusual severity, prolonged delirium, extensive bedsores, and very great prostra-

tion. Convalescence was not established until January 10, 1892. During and after convalescence he was very nervous and had had uneasy pains in the legs; his feet were tender, and he tired very easily. He had no pains in the back, no soreness; but the tenderness in the feet and nervous feelings persisted for six or eight months after convalescence, and he does not think that they have ever entirely disappeared. He attended, however, to his business, gained in weight, and felt pretty well, though never entirely free from uneasy sensations in the feet and legs. In the spring of this year these symptoms increased, particularly after some sprees. He had neuralgic pains in the legs and felt weak and unstrung, and evidently got into a very nervous condition. He had a dread of walking, and could scarcely force himself to go as far as the corner of the street. He slept badly and got into a state of extreme neurasthenia. There were twitchings of the muscles, the feet and hands felt numb, and he complained that when his shoes and stockings were off there was a smooth feeling, as if something was between the feet and the floor. At this time a doctor in New York suggested that there was some oncoming spinal trouble, and stated that in testing the sensation down the spine with hot and cold water he could not distinguish between them. He ordered him electricity and massage and general tonics, and for the past seven or eight weeks he has not been at work and has improved a good deal.

Present condition. Tall, able-bodied man; looks a little pale; gait is normal, not spastic; station good; no Romberg symptom; no atrophy of muscles; legs scarcely in proportion, however, to the rest of the muscular development. The spine is straight; nowhere painful on pressure; no special prominence of any vertebra. Sensation is everywhere good; no retardation; distinguishes easily between heat and cold. He thinks that about the feet and ankles the sensation is a little blurred and unnatural. He feels, however, a sharp point and distinguishes readily different objects, and the thermic and painful sensations are unaffected. He has no abnormal sensations about the back and abdomen, and has not any sense of constriction or girdle pains. There is no vasomotor disturbance. He sweats, however, easily and the hands are clammy, and he has had at times, he states, marked blueness and congestion of the feet, and they are often cold in the morning.

The reflexes are increased, knee-jerks active, particularly on the left side, and a slight ankle-clonus can be obtained. The skin reflexes are normal. There is no disturbance of the special senses. The pupils are a little large, equal, and react to light. The optic disks are normal; there is no restriction of the visual fields.

The examination of the thoracic and abdominal organs is negative.

Here, after a protracted and severe attack of typhoid fever with delirium and severe nervous symptoms and tardy convalescence, the patient had disturbed sensations in the feet and legs, aggravated shortly after, but diminishing somewhat within five or six months, never entirely disappearing, and recurring with some intensity during the period characterized by pronounced neurotic manifestations. Unlike the cases before described, there were no pains in the back and abdomen, only a sensation of weakness. The symptoms suggest (1) central (spinal)

lesion, (2) neuritis, or (3) a neurosis. From his statements it was evident that the doctor in attendance feared a central affection; but the patient's condition two years from the date of the fever would speak very strongly against any such view; nor does the case conform in its clinical history to a neuritis. The man insists that the feelings which he has now in the feet were also present during the convalescence and some months subsequently. There did not appear to have been any very special muscular weakness, such as sometimes develops after an attack of typhoid fever without any evidence of peripheral neuritis. In the paper by Dr. George Ross, "On Paralysis after Typhoid Fever,"[1] he refers to those cases in the following words: "It is not unusual after typhoid fever of considerable severity to find a definitely enfeebled condition of the lower extremities persisting for some time, and sometimes a person never entirely recovers his capacity for walking long distances. Such paretic cases have never been specially studied, but it is probable they would if any should fall under the head of defective innervation from prolonged exhaustion of the nervous centres." On the other hand, in the case under discussion the history and the general appearance of the patient suggest a neurosis following typhoid fever. The paræsthesiæ such as described are not uncommon symptoms of neurasthenia, in which also exaggerated reflexes are not at all infrequent.

It is not unlikely that under the designation of "typhoid spine" Dr. Gibney has described several distinct affections, and I would not be understood as holding that there may not be a perispondylitis. Nor are all of the painful backs following typhoid fever neurotic. Thus:

A patient recently under my care (hospital, No. 8049) was admitted in an attack of moderate severity about the end of the third week, the temperature falling to normal by the twenty-sixth day; then after a period of apyrexia of seven or eight days he had a well-marked relapse of about two weeks' duration. During convalescence he began to complain of severe pain in the back of the neck and at the attachment of the muscles of the occipital bone. There was no actual tenderness in the vertebræ, and movements to and fro and laterally were not associated with any very great pain. An application of the Paquelin cautery relieved it for a few days, and then it recurred. The examination from the pharynx was negative. The condition persisted for at least two weeks, and, while at first confined to the neck, subsequently he had soreness and stiffness of the back; he walked stiffly and held himself very erect. He says that it is better when moving about than when lying down. No special tenderness in the spine; no sharp pains; no increase in the reflexes; no indication of neuritis. He gradually improved, and when discharged he was very much better, having gained eleven and one-half pounds in weight.

[1] Transactions of the Association of American Physicians, vol. iii., 1888.

ON THE MICROBIC ORIGIN OF CHOREA: REPORT OF A CASE, WITH AUTOPSY.

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The more recent studies of the pathology of chorea have led to a practically unanimous conclusion that the seat of the disease is primarily in the bloodvessels and the blood, with secondary degenerative changes in the parenchyma, and that the cause is either some microbe or toxic substance, or both. The evidence regarding these points was collected by me in an article on the pathological anatomy of chorea published in *Brain*, April, 1890.[1] Since then an article on chorea with a contribution to its germ theory has been published by Dr. Henry J. Berkley in the *Johns Hopkins Hospital Reports*, 1891, vol. ii., No. 6. The examination of Dr. Berkley's cases led to the opinion that they were of infectious origin.

The anatomical seat of the disease probably varies. The principal changes are in the brain, and are sometimes chiefly in the cortical and sub-cortical motor areas, often perhaps in meninges as well as cortex.

The case I present seems especially valuable because it was originally a typical case of Sydenham's chorea; the lesions are distinct, and a very careful bacteriological examination was made with fruitful results.

The case has also a clinical value because it shows the gradual evolvement of a motor disorder not strictly like chorea, yet developing upon a perfectly typical attack of that disease.

Summary of the Case.—*Male, aged thirty-four years; family history good; acute rheumatism at tenth year, Sydenham's chorea at fourteenth year; repeated attacks of the same disease every two or three years, final attack eight months before examination; general violent choreic movements, affecting face, tongue, neck, especially, but also arms, trunk, and legs; tonic spasms in neck and back at times; rhythmical movements of head and arms at times; no paralysis, no anæsthesias or pains, no endocarditis; general nutrition fair; mental development good; cessation of movements during sleep; death from exhaustion. Autopsy: chronic lepto-meningitis of convexity of brain, hyaline bodies in brain cortex, slight meningitis of the upper part of spinal cord, slight meningo-encephalitis; diplococci found in the proliferating tissue between meninges and brain; heart normal.*

Bernard E.,[2] aged thirty-four years, merchant; admitted November 3, 1891. Family history good; father and mother still living; one sister and one brother died in infancy. No chorea in family.

[1] Richter (Western Lancet, vol. xii. p. 529) found cocci in the blood in a case of chorea. Donkin (Brit. Med. Times and Gazette, 1884, vol. ii. p. 743) found some rod-like bodies in the tissues. Naunyn (Mitth. a. d. med. Klin. zu Königsberg, 1888, p. 296) found fungi in the pia.

[2] This patient was kindly referred to me by Dr. R. H. Sayre, to whom I am also indebted for important notes regarding the history.

Previous history. Patient suffered in childhood from chickenpox and measles. At ten years he had a severe attack of rheumatism that kept him in bed for six months; this involved his knees, ankles, hips, and shoulders. Between ten and fourteen years he was well, except for occasional returns of his rheumatism.

Present disease. At fourteen his symptoms of chorea began; first with feelings of muscular uneasiness, then followed by irregular, twitching movements, noticed first in left hand and left side of neck. These spread so as to involve the greater part of the body, but continued more marked on left side. Attack resembled the ordinary form of chorea of Sydenham. After a few months there was a remission, but the disease returned every two or three years and was so severe as to keep the patient in bed for five or six months. Between the attacks the symptoms were slight. The present attack began in March, 1891, eight months before I saw him.

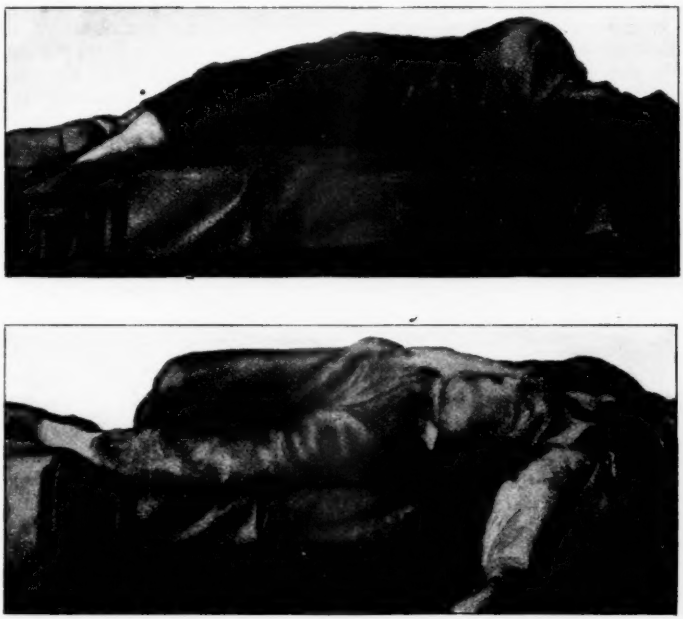
Status præsens. Patient was a man of average height and fairly well nourished; he was able to walk, but did so with some difficulty. He suffered continually from jerky movements of the face, neck and arms, and the trunk of the body; the legs also were somewhat involved. These movements were in the main choreic in character; the head would be jerked back and sideways, the facial muscles would twitch; the tongue movements were so active that speech was indistinct. There were occasional spasmodic twitchings of the eye muscles, producing conjugate deviation usually. The muscles of the neck, particularly the sterno-mastoid and deep rotators on the left side, were greatly involved. The arm movements were irregular and incoördinate; occasionally there was a marked tremor in them. The movements were especially those of flexion of the wrist, flexion and extension of fingers, pronation and supination of the wrist. The trunk of the body was affected, more particularly the movements of the back; the head would be carried back so that for a moment he would be held in a condition of opisthotonos. In the latter stages of his illness this involvement of the muscles of the back became particularly severe, so that the patient would suffer practically for several days from a condition of opisthotonos, or what might be called clonic opisthotonos, the body being arched back so that he could only lie on his side in bed. The continual movements of the body made it difficult to secure a satisfactory photograph: Fig. 1, however, gives some idea of the nature of the affection. The muscles of the body were well developed, particularly those of the neck and back, and there was nowhere any sign of paralysis. The dynamometer with the right hand registered 50°, left hand 45°.

There was no anæsthesia or hyperæsthesia and no tenderness or points of pressure which gave relief from the spasm. The reflexes were normal so far as could be ascertained. There were no trophic or vasomotor disturbances. The patient slept fairly well, and during sleep the movements ceased. He had no headaches that he particularly complained of, and his mind was clear. He was an intelligent man, but very much and very naturally depressed over his malady. He had later in his disease considerable pain during the more severe spasms which affected his back. The lungs, heart, kidneys, and abdominal viscera were normal. He had no rise of temperature.

Patient was placed upon large doses of chloral together with tonics; these gave him some relief, but produced no permanent benefit.

Various other measures, including iodide of potassium, hyoscine and anti-spasmodics, and morphine, were employed without any special benefit. One month after admission, in a fit of depression, the patient attempted suicide by cutting his throat with a safety razor. He was discovered by the nurse before he had accomplished the deed and was transferred to the surgical side for treatment. He had managed to cut one of the sterno-cleido-mastoids nearly across, and the constant movements of the parts made the healing of the wound very slow. He gradually recovered, however; but shortly afterward, on January 10, 1892, he suddenly and unexpectedly died, a little over two months after admission, and ten months from the beginning of his last severe attack. His disease had lasted with remissions for twenty years.

FIG. 1.



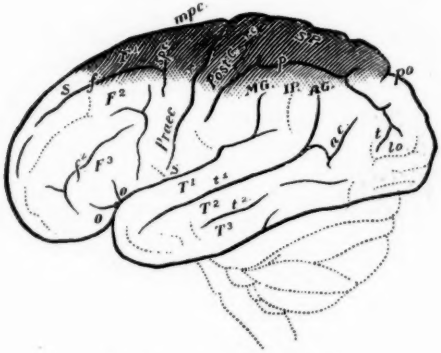
Chronic chorea, showing attitudes assumed during the spasmodic movements.

The autopsy was made next day by my house physician, Dr. Gwathney, to whom I am much indebted for the details of this case.

Body slightly emaciated; rigor-mortis marked. Lungs showed some œdema and hypostatic congestion; calcareous concretion in left pleura about the size of a chestnut. Kidneys showed cortex diminished, some congestion, markings fairly plain, capsule slightly adherent; they presented the appearance of some diffuse nephritis, chronic in character. Stomach showed increase of interstitial tissue; no marked congestion. Spleen and intestines normal; liver much congested.

The *brain* was large, weighing fifty-four ounces. The dura mater was not adherent and appeared normal. No excess of fluid in the cavities. The brain was considerably congested. The bloodvessels at the base were normal. Over the convexity of the hemispheres on both sides was a granular thickening of the pia mater and arachnoid. This presented the appearance of a chronic proliferative meningitis; it reached from the base of the first frontal convolution back to near the occipital lobe; it extended down nearly half-way on the great convexity of the brain and also about half-way upon the median surface. On cutting through the membrane here it was found to be thickened and slightly attached to the surface beneath. It was impossible to get the spinal cord, but a portion of it, extending to about the fourth cervical, was cut out through the foramen magnum. The pia mater about the cervical cord and medulla seemed somewhat thickened and congested. The brain was hardened in Müller's fluid for about three months, and portions of the coxtex were stained in carmine and Weigert's solution of hæmatoxylon. A section of the hemisphere involving the thickened meninges was cut out and placed at once in alcohol and there hardened. This was subsequently stained and examined for bacteria by Dr. Brooks, of the New York Post-Graduate Laboratory. Dr. Brooks made a very large number of examinations of the membranes, and I am greatly indebted to him for his painstaking investigations.

FIG. 2.



Showing area of lepto-meningitis.

Microscopical examination. The parts examined microscopically were mainly the superior parietal lobule and upper central convolution, as it was these parts that were most severely involved in the process. Examinations were also made of the basal ganglia, the internal capsule, and a series of sections was made extending down through the pons and medulla and upper part of the spinal cord.

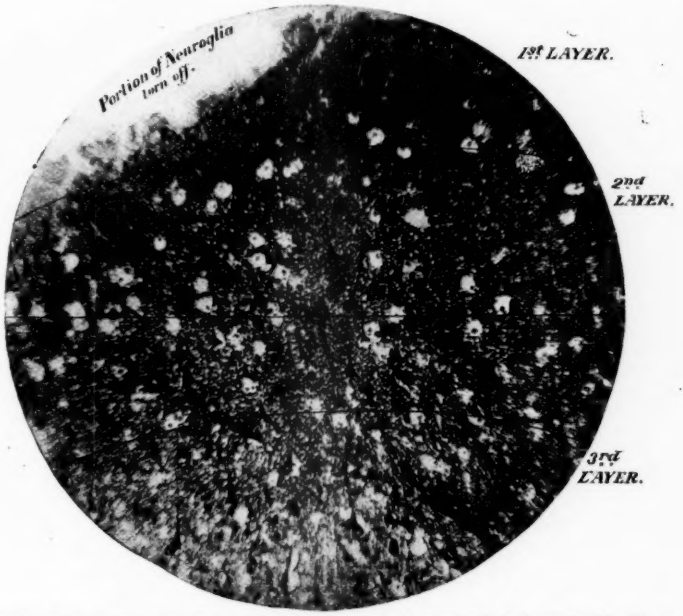
The detailed notes are as follows:

Superior parietal lobules. The pia mater is thickened, this being due to a rich connective-tissue proliferation; but there is no exudate or round-cell infiltration. It is simply a chronic proliferative thickening. (See Dr. Brooks's report.) (Fig. 2.)

The superficial or neuroglia layer of the cortex shows, in some areas, distinct softening or degeneration with a rich cellular infiltration, apparently coming from the meninges. This infiltration does not extend beyond the neuroglia layer. The vessel walls are slightly thickened, and there is perivascular dilatation in the outer and small pyramidal layer.

In the specimen which was hardened in alcohol alone, numerous large hyaline masses were seen, both in the pia mater and just below it, extending in smaller numbers as far as the second layer of the cortex. These masses do not stain; they are irregular in size, but average $\frac{1}{100}$ inch in diameter. They are evidently *artefacts*, yet indicate a morbid condition of the nervous tissue. They lie sometimes around, but not in, the vessels.

FIG. 3.



Section from superior parietal lobule, stained with carminate of soda and osmic acid. Photographed by Dr. J. H. Smith; bromide enlargement; details added. ⅔ objective.

The specimens hardened in Müller's fluid do not show these bodies. In these latter specimens, however, including those hardened in osmic acid and bichromate of potash, a different kind of hyaline bodies is seen. They are found chiefly in the second (angular cell) and third (small pyramidal) cell layers of the cortex. They are round or nearly so, translucent, and do not stain in carmine, hæmatoxylon, or osmic acid. They are about $\frac{1}{1000}$ inch in diameter. In the centre of most of these there is a nucleus. They appear to be neuroglia or pyramidal cells undergoing some degenerative change (see Figs. 3 and 4).

There are places where it seems as if one could see a pyramidal cell undergoing a hyaline degeneration (Fig. 4, *a*, *b*), but of this I cannot feel certain. The bodies do not (like the large hyaline masses) seem to stand in any relation with the bloodvessels.

It was in these regions where these degenerative changes were seen that micro-organisms were found as detailed below. The nerve cells proper do not show any decided changes, at least with any stains I was able to use (carmine, logwood, osmic acid, methylene-blue). The outlines were sharp and nuclei distinct. Here and there, however, it seems as if the hyaline change was attacking a cell (see Fig. 5). The bloodvessels show no decided change either as regards thickening, dilatation or proliferation.

FIG. 5.

Drawings of hyaline bodies and pyramidal cell as seen by $^1/_6$ and $^1/_{12}$ objectives.

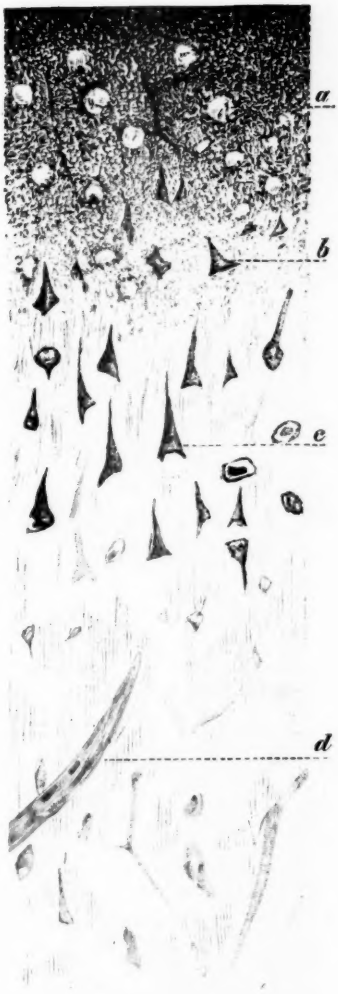
The changes above described were found to exist in all parts of the cortex where there was meningeal thickening, but were much more pronounced in the superior parietal and upper central convolutions. Other parts of the cortex were normal.

Sections of the lenticular nucleus, and particularly of the putamen, show considerable vascularity, and a few of the *small hyaline bodies* such as are seen in the cortex. These bodies are still more numerous in the claustrum, however, and the external capsule. The substance of the pons and medulla is nearly normal. There is some congestion of the nerve nuclei, but the fibres and cells are normal and no hyaline bodies are seen here.

At the exit of several of the cranial nerves, particularly the seventh and sixth, the meninges are much thickened; the arteries show a peri-arterial proliferation of rather active character; their walls are thick, and small hemorrhages can be seen in them. One root of the vagus seems much more congested than the other and contains a few degenerated fibres. The anterior cornua at the level of the first cervical are congested and the cells much pigmented, but not seriously injured. At the decussation of the anterior pyramids there is an artery lying in the posterior median groove having very thick walls and showing a *proliferation of the intima cells*, also a peri-arteritis. Other arteries in this neighborhood show a very striking peri-arteritis.

The hypoglossal nerve in this neighborhood is normal in its course

FIG. 4.



Chorea. Bacteriological examination.

Section of parietal lobule, stained with carminate of soda and osmic acid. Drawn from 1/5th objective. *a*. Hyaline bodies. *b*. Small pyramids. *c*. Large pyramids. *d*. Bloodvessel.

[*To face page 36.*

through the medulla, but after its exit shows much vascularization. Section shows thickened sheath with some proliferation of endoneurium cells.

The spinal branch of the spinal accessory shows the same condition even more strikingly. There are inflamed vessels, a perineuritis, and interstitial neuritis of a slight degree. These meningeal and vascular changes seem much less high up in the pons.

Bacteriological examination. Portions from the cortex of the upper central convolutions were placed at once in alcohol and hardened. These were submitted to Dr. H. T. Brooks, bacteriologist of the Post-Graduate laboratory, who made the following report:

Sections were stained in logwood, Bismarck-brown, carmine, and the Weigert stain for micro-organisms. Sections showed small, irregularly circumscribed areas of disintegration of brain substance, of varying size, extending over greater part of section and reaching to within a short distance of peripheral layer. These areas are composed of finely reticulated basement substance enclosing a more or less homogeneous material. Some areas are composed wholly of this tissue, while others (generally the smaller) include rounded, vesicular and granular nuclei, which take on intense staining. No bacteria could be demonstrated here.

The meninges showed some thickening and in certain portions slight evidence of proliferation; there were no exudative elements in this part, though rarely a small diplococcus could be made out, and when seen was invariably isolated. These organisms were confined to inner surface (portion) of membrane.

In that portion of the cortex immediately below the junction with the meninges a few small diplococci, resembling in every detail those present in brain covering, were seen, never more than two occurring in a field of $\frac{1}{12}$ oil-immersion (Leitz).

The micro-organisms were about half the diameter of a red blood-cell, and resembled very closely the *diplococcus lanceolatus.* Though not in large numbers, they were found in all the sections, and always in the deeper layer of the pia and superficial part of the cortex.

RÉSUMÉ.—There is a meningitis of the cortex which extends into and in places involves the cortex. It is characterized by an active connective-tissue proliferation and the presence of diplococci in the meninges and cortex. In the cortex are small hyaline bodies which indicate a degenerative change of the brain substance. This degenerative change affects the deeper parts of the brain to a less extent, extending down into the capsule and lenticular nucleus, but not the optic thalamus. There is a meningitis with active vascular changes in the upper part of the cord which seems particularly to surround and affect the roots of the nerves as they leave the medulla and the cord.

It seems to me that the teachings of this case are very important in many ways. First of all, it shows us that there is a close relationship between many of the chronic spasmodic disorders of irregular type and the chorea of Sydenham. Secondly, it confirms the view already generally accepted, that chorea is a vascular and humoral disease. Third, it gives weight to the belief held by many that there is, in some cases at

least, a microbe which produces this disease. Fourth, it shows that in these cases the seat of the lesion is either meningeal or superficially cortical so far as the brain is concerned, and that as regards the spinal cord the seat of the lesion is mainly in the meninges and bloodvessels, where it apparently surrounds and irritates the roots of the nerves.

Finally, we cannot explain chorea by finding any particular *seat* of the disease, though the voluntary motor tract in the brain must at some point be involved.

Neither has chorea any special form of anatomical change invariably associated with it, though degenerative hyaline change and evidences of vascular irritation are most common.

There must be, in order to produce chorea, a specific kind of irritation of the cells. This need not be of one kind; it may be a rheumatic poison or a diplococcus toxin. But the specific irritants are not numerous, for though the motor fields undergo innumerable forms of injury and disease, chorea occurs but rarely, and only when the proper regions are properly irritated. There is nothing which would explain the phenomena of the disease so well as to suppose that the specific agent producing chorea is a microbe, and perhaps some form of the diplococcus.

The various types of chronic chorea would be explained by the changes in the intensity of the irritation, its special localization, and the degree of organic change which it eventually induced.

FOUR CASES OF BRAIN TUMOR, IN THREE OF WHICH OPERATION WAS DONE—TWO OPERATIVE RECOVERIES—ULTIMATE DEATH IN ALL.

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From the diagnostic point of view the present great need is the means of determining the presence and the exact location of an intra-cranial tumor; from the operative point of view, when a tumor has been found, the means of knowing when to proceed to its removal and when not to attempt it, or, if it has not been located or not found, whether a palliative exploratory operation is wise.

The following cases are put upon record with a view of adding to our means of deciding these points. In the first case, the situation of the tumor was probably located correctly and trephining afforded a very great relief to most distressing symptoms. In the second, the tumor was almost exactly located, but, from the probable size and position of the tumor, and the condition of the patient, it was decided not to operate—a

conclusion justified by the post-mortem. In the third, the position of the tumor was erroneously diagnosticated, and an unwise operation was followed by death. In the fourth, the tumor was not recognized at the operation but was found at the suspected site at the post-mortem; the operation, while it could not afford relief, did no harm.

CASE I. *Intra-cranial tumor, probably of the occipital lobe; trephining followed by operative recovery, with relief of headache and mental hallucinations; death.*—R. M. B., aged thirty-one years, Abingdon, Washington Co., Va. First seen by me with Dr. George E. Wiley, March 26, 1892, at the Orthopædic Hospital and Infirmary for Nervous Diseases. Family history good; syphilis denied. Up to August, 1890, his health was good; but at that time he walked for some distance exposed to the sun on a very warm day, carrying one of his children. For several days after this he was drowsy and stupid and slept a great deal, and later complained of severe headache and pain in his head. There was no nausea, vomiting, or vertigo. About ten days later he had a convulsion, and three days after this a second attack. The attacks were not followed by paralysis or stupor. He rallied and got up again, but ever since has suffered from constant and severe headache and occasional convulsions, the headache being generally much severer before an attack.

His sight, hearing, memory, and ability to express his thoughts are much impaired, noticeably so since last autumn. His hearing was not good, however, before the convulsions. His eyesight varies, and at times he seems to see fairly well, while at others he is apparently almost blind. He has also lost the power of writing, the loss being mental and not muscular. He walks moderately well, though occasionally both knees "give way." He sometimes has lucid intervals, and talks quite rationally. Lately there has been considerable vomiting, but his physician thinks this may be due to the medicines he has been taking. His attacks have occurred at the following times: two in August, 1890; one January 22, one April 5, one June 4, one in July, 1891; one January 20, 1892; two in succession March 6, and the last one March 24, two days ago. There has been no paralysis after any of the attacks.

Status præsens, March 26th. A fairly well nourished man, who practically complained of but two things, blindness and intense headache. His pupils were very widely dilated, but he was only able to observe a slight difference between total darkness and three bright gaslights directly in front of him. The headache he located just above the line of the lateral sinus and a little to the left of the middle line. Percussion and pressure at this point, as at other points on the skull, were not painful. He was able to walk when guided, though he did not seem to walk firmly. This, however, may have been due to his mental uncertainty resulting from his blindness. Absolutely no localizing symptom was present. A careful examination of the eyes showed marked double optic neuritis with other details, but unfortunately the notes, which should have been entered in the hospital case-book, have unaccountably been lost.

Diagnosis: An intra-cranial tumor, which cannot be located. Treatment: Trephining was recommended, with a view to relieving his intense headache. It was determined, after consultation with Dr. S. Weir Mitchell, to do this at the point of localized headache. If the tumor be found, such surgical measures as seem proper will be followed.

If no tumor be found, or if when found it should be inoperable, the dura will be closed and the bone will not be replaced.

Operation, March 31, 1892. An inch-and-a-half button of bone was removed over the left occipital lobe, and the bone gnawed away until the opening measured 2.5 by 1.5 inches. The dura was divided semicircularly, and the moment this was done the brain bulged very markedly. Pulsation was not very visible, but was perceptible by touch. The cortex appeared to be normal. I passed my little finger between the brain and the dura all around the opening for an inch, and believed that I felt more resistance down toward the tentorium than elsewhere. Accordingly, to search for the probable tumor, I made a small incision with a knife through the cortex and passed my little finger gently into the brain for a depth of one inch. I was still convinced that there was great resistance toward the tentorium, but no distinct tumor was perceptible to the touch. Gently withdrawing the finger, I now cautiously inserted a grooved director in the direction of the cerebellum. At a depth of an inch and a half I met with quite noticeable resistance, which was overcome with slightly greater pressure. The pressure seemed to diminish again at a depth of 2.5 inches from the surface. I believed, therefore, that I probably had to deal with a tumor lying an inch and a half below the cortex, and although I could not define its size, the amount of bulging was so great and increased so much that I came to the conclusion that the tumor was a large and, therefore, irremovable one.

Accordingly, I now endeavored to close the dura. This I found a task of great difficulty. I had fortunately provided myself with a teaspoon and a tablespoon, both sterilized by boiling. I inserted the handles of these under the dura, and gradually, by means of them and my fingers, was able to press back the cerebrum to a certain extent, so that I could approximate the edges of the dura, although I could not bring them into contact. In doing this about a tablespoonful of the brain tissue was necessarily lacerated and removed. During the entire operation the bulging increased continually, until when I decided to close the dura at least as much brain as would correspond in size to an English walnut was protruding. The greatest gentleness was used throughout, but in spite of this considerable laceration occurred, especially in the attempt to reduce it. The bone was not replaced. The flap was sutured in position without drainage.

His further history was very interesting. At first there was considerable pain in the right arm, which became œdematous and congested for several days, and also in the right leg. The dynamometer showed a difference of muscular power, varying in the right hand from 40 to 60 and in the left from 80 to 90 degrees. Sensation and motion in the right arm and leg were moderately diminished, especially on the inner side of the right forearm, and were entirely absent on the extensor surface. Gradually, however, this disappeared to a large extent. His highest temperature after the operation was 99.6°. The wound itself healed by first intention throughout.

The changes at the site of operation and in his mental condition were most important and interesting. From the moment of the operation his headache entirely disappeared, and had no other improvement taken place, this alone would have justified and have repaid him for the operation, with its attendant risks. Moreover, all his hallucinations disap-

peared, and he became a quiet and tractable patient. Within a few days after the operation marked bulging took place where the bone had been removed. This was presumably due to a large extent to cerebro-spinal fluid, but probably also partly to a subcutaneous fungus cerebri. The annexed photograph (Fig. 1) shows well the curious shape of his head as a result of this bulging. The bulging was so great that I feared at first the cicatrix would give way and we should have an open fungus cerebri, but fortunately the union was sufficiently firm to resist the pressure, and although about six weeks after the operation, on several occasions, a pin-point rupture occurred in the line of the cicatrix, this gave no further trouble than the discharge of two or three ounces of cerebro-spinal fluid.

FIG. 1.

Shows the peculiar shape of the head from bulging of the scalp at the site of the trephining from a subcutaneous fungus cerebri and accumulated cerebro-spinal fluid. The ends of the incision also are shown. (Photographed by Dr. Wm. J. Taylor.)

The patient was discharged from the hospital seven weeks after the operation. By a letter from Dr. Gammon, his physician in Virginia, I learned that he died on August 9, 1892, four and a half months after the operation, having been relieved of his distress by it, but without the possibility of saving his life. Dr. Gammon was kind enough to send me his brain, but unfortunately by the time it reached me, the weather being excessively hot, it was in such a state of decomposition that no examination of it was possible.

There would seem in this case to be no doubt as to the diagnosis of cerebral tumor, although unfortunately the decomposed condition of the brain makes a positive assertion on that point impossible. The case is noteworthy, as, although not curative, it was exceedingly successful in palliation. The relief to the headache alone was to the patient a boon

worth any risk, and when to this is added the entire disappearance of his delusional insanity, the operation becomes still more commendable. When he first entered the hospital it was necessary to keep a special nurse constantly at his bedside, lest harm might result from his delusions. After the operation he was treated as any other patient, and required only the ordinary nursing of an operative case.

The shape of his head, as a result of the operation, is very peculiar. It is due, I believe, partly to cerebro-spinal fluid, but largely to a fungus cerebri existing under the scalp. Since his case I have had another of compound fracture, with a large loss of bony tissue, in which precisely the same deformity in the shape of the head has followed, and which has thrown light on the deformity. In this latter case, some months after the injury, I was obliged to remove a large piece of necrosed bone, and in doing so was able to investigate the contents of the tumor, and found it partly liquid and partly made of the fungus cerebri itself.

Two remarks from an operative point of view seem also to be demanded: First, that tumors which are inoperable should be meddled with as little as possible. Warned by past experience, especially by one case in which death followed a too extensive interference upon my part, I made up my mind that in such a tumor as this, large and deep, I would not attempt to do too much. The wisdom of the slight interference which I practised is, I am sure, emphasized by the result.

Secondly, I would call especial attention to the value of the amount of bulging of brain as an indication of the size of the tumor. Of course, the bulging is really only the measure of the increased intra-cranial pressure due to tumor, accumulation of fluid in the ventricles, etc., but in cases of tumor the amount of bulging will be chiefly due to the tumor itself, unless it has produced an acute internal hydrocephalus. The amount of bulging, therefore, will enable us to some extent to decide on the wisdom of greater or less interference in such cases. In another case (not yet published because not yet terminated) somewhat similar to the present one, where it was certain that there was great increase in the intra-cranial pressure, I made an initial incision into the dura only one inch in length, which I intended to enlarge if examination of the brain itself showed it to be wise to do so. Through this I explored for the supposed tumor, and failing to find it, but discovering greatly increased pressure and marked tendency to escape of the brain tissue even through this small opening, I closed the dura without any laceration of the brain tissue other than that produced by the punctures. The patient made a rapid and steady recovery, and has been free from headache and other tumor symptoms since. Had I opened the dura freely in this last case I am sure that I would have had the greatest difficulty in replacing the brain tissue within the dura, and very likely it would have been even impossible to do so. Not only one but, if

desirable, two or more small openings could be made to search for such a growth. Very possibly death might have resulted had I not been so cautious.

CASE II. *Glio-sarcoma of upper motor area; no operation; death.*—N. F., aged seventeen years, was first seen in consultation with Dr. R. M. Girvin on October 1, 1889. On October 3d Dr. Morris J. Lewis saw him at our request, and was kind enough to write out the following history as obtained at our various visits: "In November, 1886, the patient fell from the roof of a stable, a distance of about twenty feet. The fall broke his right thigh and left forearm. He also struck his chin, cutting it severely, and knocked out one of his front teeth. He was not known positively to have struck his head, although he was rendered unconscious by the fall, and remained so for some time. The next day all symptoms of concussion had passed away. He was treated in the University Hospital, and made a good recovery. After this accident he became a very wild boy. Several attempts were made to find a suitable school for him, and finally he was sent to a military academy.

"His family history is as follows: Paternal grandmother died of consumption, maternal grandmother has diabetes, a maternal uncle who during the war was twice wounded in the head, involving the brain, committed suicide; his father is frequently troubled with attacks of asthma; one of his sisters has hay fever, and the patient has had several attacks of asthma and bronchitis and chronic nasal catarrh. Nothing else worthy of note occurred in the patient's history until the above accident. He never remembered being struck on his head. Two years ago he had an abscess in his left ear; this, however, only discharged for a few days, and gave him no further trouble.

"In April, 1889, nearly two years and a half after his fall, his right leg began to feel weak, the knee at times giving way under him. This condition was not constant, but would come and go, lasting but a few moments at a time. About the same time, but certainly after the leg, the arm became affected in a similar manner, the weakness being always most marked in the leg. These attacks did not occur simultaneously in both limbs, but alternated with one another. His right eye at this time was congested, and hurt him to use it, so that he read with this eye covered. Headache was also present, and was so severe that he had to apply ice-bags to his head in order to be able to study. He also had several hysterical attacks at this time. He was now seen by a well-known surgeon, who prescribed a brace for his knee. He came home in June, having completed his examinations, complaining of weakness in the leg, and dragging it slightly when he walked; his arm was also giving him occasionally more inconvenience. At one meal, perhaps, he would be unable to use a knife or fork, while at the next he would have no difficulty. After this he began to have numbness around his mouth on both sides, particularly at the corners, and occasional numbness in his leg. About the latter part of June his headache, which had been more or less constant, began to be more severe; he would awaken between 2 and 5 A.M. with intense pain in the frontal region. This would generally pass off in a few hours, and eating always relieved it. Nausea and vomiting were also distressing symptoms at this time, occurring two or three times a day. With these attacks his face would become very much flushed, and the veins would stand out prominently.

Pressure seemed to give relief. About this time he had a long siege with the dentist, and seemed much exhausted by it.

"In the middle of July, 1889, he was noticed to be constantly covering one or the other eye with his hand, as if to obtain a single vision, and soon afterward awoke with marked internal strabismus of the left eye. This lasted for three or four weeks, and left suddenly. On one or two occasions in July he had transient attacks of paresis of right face, arm and leg, and had some trouble in remembering words. Hallucinations were occasionally present. By the latter part of August he had become very weak, had constant nausea, and was very constipated, once going fourteen days without a passage.

"On September 8th, after marked flushings of face and headache, he had an attack as follows: He rolled over on his right side, drew back his head and became unconscious for a moment or so; he uttered no cry, did not bite his tongue, and no convulsive twitchings were seen, neither did any part, except his neck, become rigid. He was not stupid after the attack; he could talk well, and no change in the paretic side was noticed. After this he was very weak and had extreme nausea.

"On September 17th he had a second attack; there was no warning except an increase of headache, he rolled over on the right side, uttered no cry, threw back his head, turned the face to the left, and thrust out his tongue, to which side is not known. There was also marked opisthotonos; no movements occurred in the paretic limbs, but he moved the left arm back and forth, and drew up his left leg. His face was purple and his breathing stertorous. Heavy sleep followed this attack, and he was stupid for a week or more. During this time he took no notice, did not speak, and had incontinence of urine; there was also great trouble in deglutition. He then began to recover; his nausea stopped, and he began to talk of food. There was no aphasia.

"Since July, the time of the appearance of the squint, he has not seen well, but not much attention was paid to this symptom until September 28th, when for two days he said he could not see. It is reported that during the summer his pupils responded well to light, although they were quite large—as, in fact, they have always been. On the 27th of September Dr. Girvin found that the pupils responded slowly to light, but that two days later he could obtain no response. During the summer Dr. D. Hayes Agnew saw him and made a diagnosis of intracranial tumor, but deemed it inadvisable to operate.

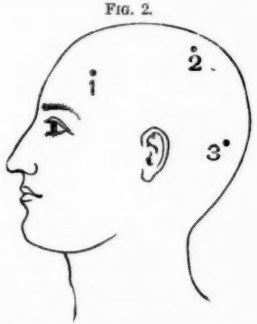
"*Status præsens*, October, 1, 1889. He has just had an increase of the headache and has been vomiting freely; he is in consequence much weaker and more listlesss than common. His eyeballs are quite prominent and the pupils widely dilated, the left being slightly the larger. There is slight divergent strabismus of both eyes, the right eye being turned up more than the left. Slight ptosis of both lids exists, although he can move the lids with moderate freedom. When the examination began he was unable to move the eyeballs in any direction except upward, but before it was finished he could move the balls downward a little, and also outward, the left eye moving outward better than the right. There was decided paresis of the lower portion of the right facial nerve; very slight of the upper portion. He is said to have always laughed on the right side of his mouth. The tongue is thrust out perfectly straight. The right side of the palate is paretic; there is decided rigidity of the neck, an attempt to flex the head on the chest lifting the shoulders and

causing pain, rigidity of the muscles being equal on both sides; almost complete paralysis of the right shoulder muscles exists. He is able to move the forearm, wrist, and fingers feebly. Dynamometer: left, 27; right, 3. Right leg almost completely paralyzed; can only flex the thigh feebly on the abdomen, with the tendo Achillis contracted, the foot extended and the toes slightly extended. Sensation and localization are but little if at all impaired. The ankle-, knee-, and elbow-jerks are absent on both sides; the plantar reflex slight on both sides, on the right consisting of extension of the toes; the cremasteric, abdominal, and epigastric reflexes are all diminished on the right side, good on the left.

"Left calf measures 9¼ inches; right calf, 8¾ inches; left thigh measures 12½ inches; right thigh, 11½ inches. Lungs, normal; heart, accentuation of second sound at right cartilage, no murmur; action at times irregular, eighty beats to the minute. There is pain over the left brow, with occasional flashes of light. The veins over the forehead are prominent, particularly over the left temple. There is slight œdema of the scalp, equal on both sides. There is slight incontinence of urine, and marked constipation.

"The pulse is said to have varied from 45 per minute, to 120, the slow pulse occurring before, and the rapid after an attack. There is a tender spot on the scalp, which has only appeared during the last few days; it is situated one inch to the left of the longitudinal fissure, and about one inch behind the upper end of the fissure of Rolando. This is not the seat of spontaneous pain, but percussion causes decided inconvenience.

FIG. 2.



Points at which the surface temperature was taken.

"October 3d, patient is decidedly brighter, talks fluently, and takes an interest in his surroundings. Attempts to flex the head still encounter resistance and cause decided pain at the ensiform cartilage. Temperature of right temple, 95°; of left, 96°. That of the scalp cannot be determined, as the hair is long. This also interferes with the determination of the percussion note. He hears well on both sides. The sense of taste appears unimpaired. He cannot recognize the odor of vinegar, brandy, or paregoric, but notices, and after some hesitation recognizes ammonia. Mistakes alcohol for Florida water.

"He had a great deal of headache this afternoon, said to be caused by the barber shaving his head. He refused to allow anyone to talk in the room, and percussion of the skull was out of the question. No scars are

visible. Just over the site of the posterior fontanelle there is a swelling the size of half a large grape, evidently a distended vein or veins, easily dispersed by pressure, but immediately returning. No signs of an opening in the skull and no tenderness at this spot.

"The surface temperature was carefully taken, the thermometer being held in position for eight to ten minutes each time; a second record was taken over the tender spot (marked 2 on diagram) for accuracy. With the exception of this spot the left side of the head is the warmer. (Fig. 2.)

"Temperature, October 3, 1889: Left axilla, 98¼°. 1. Left temple, 94⅘° (October 2d, 96°); right temple, 94° (October 2d, 95°). 2. Tender spot near left parietal prominence, 96°; analogous spot right side, 96½°. 3. Occiput, left side, 97°; occiput, right side, 96½°."

Dr. Charles A. Oliver made the following report upon his eyes:

"The patient was first seen on September 30, 1889. His family gave the following ophthalmic history: On July 15, 1889, the left eye suddenly 'turned in,' and as quickly straightened three weeks ago. On September 27, Dr. R. M. Girvin examined the pupils and found that the irides responded to light-stimulus. On the following day the patient became suddenly 'blind.'

"Careful examination showed that the vision of the right eye, which was reduced to the faintest light-perception, was distinctly hemianopic in type; the blind half of the field being upon the right side. The field of vision of the left eye, which was larger than that of the fellow eye, was also hemianopic in character; with a large double curved line separating the seen portion to the temporal side (fair light-perception) and the unseen portion to the nasal side. The pupils were evenly and fully dilated, and the irides were absolutely immobile to light-stimulus thrown from any point whatever, even from any portion of the remaining fields of vision. Although it was impossible to obtain any subjective study of the movements of the ciliary muscle, yet the catoptric test, carefully though, of course, roughly applied by the use of a moving candle-flame and a proper magnification of the reflexes, failed to show any movements or changes in sizes of the flame-images upon the anterior and the posterior poles of the lenses. The separated and the conjoined movements of the extra-ocular muscles showed that the superior recti performed the greatest excursions (about four millimetres each from a supposed primary position of the eyes); the inferior recti, about three millimetres each; associated movements of the two globes to the right, about one or two millimetres; associated movements of the two globes to the left, almost disappeared; and attempts at binocular convergence absolutely gone.

"The ophthalmoscope revealed a marked choking of the optic disks (to about 4. D.) the summit of the swollen nerve-head tissue being to the nasal edges of the disk. The swellings, which appeared soft and œdematous and extended two disk-diameters' distance into the circumjacent retinal areas, were rendered quite red by numerous vascular enlargements. They were equal in degree and density. The retinal veins were tortuous, and the corresponding arteries were narrowed and reduced in size.

"The findings may be summarized as follows:

"1. Right homonymous hemianopsia, the greater loss of vision and the lesser area of remaining field being upon the right side.

"2. Binocular total irido-cycloplegia.

"3. Binocular partial external ophthalmoplegia more marked on the left side, and more pronounced with the third and the sixth nerve groupings.

"4. Double optic neuritis (soft and œdematous in character and very vascular in type), equal in apparent degree and density on the two sides.

"The subsequent changes are as follows: On the following day he was seen by Dr. Lewis, who, in addition to the general findings, noticed that the pupil of the left eye was the larger, and that although the inferior recti could perform better excursions than upon the day before, there was a marked double divergent squint.

"Two days later paresis of both levator palpebræ muscles appeared, causing marked ptosis; the upper lids being elevated by the compensatory action of the fronto-occipitalis muscle. The action of the compensating muscle, which was more pronounced on the left side, allowed the left lid to be elevated four millimetres, whilst the right lid rose but one millimetre. The right eye was now blind, and the left eye retained a small excentric field for strong light-stimulus to the outer side. The right eye was directed not only inward, but upward. The same eye, curious to say, presented the broader rim of iris.

"These facts suggested the following probable diagnosis:

"Pressure on both optic tracts, which is more pronounced on the left side with an upward pressure on the floor of the fourth ventricle, that is more marked on the left side, and extravasation of cerebro-spinal lymph into the intra-vaginal spaces of both optic nerves—significant of a tumor mass—occupying the lower portion of the left mid-brain."

October 7th. The following changes were noticed in his condition: His stomach is very much improved, and he had eaten a hearty dinner; he is hungry most of the time; ordered simple but nourishing diet every two or three hours. He can move both eyeballs in every direction, but not to the full extent. His ptosis is less marked. At present his vision is unchanged. His right arm he is able to move with considerable freedom in all its segments; his right leg he drew up quite well and almost completely; he could not flex the ankle; movements of the toes existed, but seemed not to be voluntary. The habitual position of the foot was in exaggerated extension of the ankle and the toes. The ankle could be flexed passively, the contracture of the calf muscles having apparently disappeared.

The tender spot on his head was located farther front than before, over the upper portion of the left Rolandic line. It was ill-limited, but distinctly tender on pressure. Sometimes a second attempt at pressure, after an interval occupied with other examinations, would not elicit tenderness. Some tenderness existed at nearly the corresponding area on the right side. Direct percussion of the skull by the finger-tip elicited no special area of tenderness; neither mediate percussion on my own finger, nor direct percussion by the finger-tip, elicited any difference in the percussion note. Lifting him up with the hand under the occiput, the neck was found to be somewhat stiff, but the head could be flexed to a moderate extent without producing any pain at the ensiform cartilage, and only moderate pain in the neck.

I examined very carefully into the question of possible syphilis. His family and himself both denied it, he himself with a frankness which

seemed to carry evidence of truth. The physical examination showed the genitals well developed, but no more so than was proper at his age. There was absolutely no scar on the penis, none in the groin, no enlarged glands at any point; nor could I find any other evidence of syphilitic infection.

14*th*. Up to the 12th inst. he had been steadily gaining. He was able to turn over in bed promptly and with ease, the turning to the left being not so easy as that to the right, on account of the weakness of the right leg; freedom of the movements of the arm had increased. His appetite has been almost voracious. On the 12th, possibly due to the indiscretion in diet, he vomited all day, and both yesterday and to-day he has been more or less listless and miserable; his pulse, however, has not gone above 72; his tongue is coated; bowels constipated. On lifting his head by the hand under the occiput, the post-cervical muscles are very tense, and he still complains of pain, but locates it at the mid-sternum and not at the ensiform cartilage; this pain does not appear when he attempts to flex his head voluntarily. There is moderate ptosis, but he can lift the upper lid voluntarily without elevation of the eyebrows. The pupils are both slightly smaller than before, especially the right one, and both respond feebly to light; the eyeballs can be freely moved in all directions.

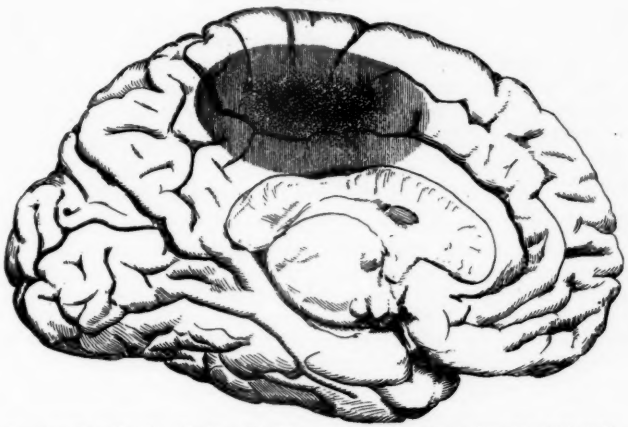
November 18*th*. His pulse of late has been but forty or fifty to the minute; he became more stupid, and died this morning at four o'clock.

Post-mortem, November 19th, 12 M., thirty-two hours after death. Nothing abnormal was observed about the scalp or on the exterior of the skull. When removed, the skull-cap was extremely thin; it was transparent in a great many places, and over the longitudinal sinus posteriorly was almost perforated by a Pacchionian body. There was no meningitis; the veins were moderately full. The brain substance in the motor area looked entirely normal, but it was evidently soft and flabby over a large area.

Dr. W. J. Taylor, who made the post-mortem, passed his finger into the median fissure, without observing anything abnormal; but when the two hemispheres were separated in the left there was a mass, blackish in color, occupying the space midway between the corpus callosum and the upper surface of the brain, in a position corresponding to the paracentral lobule, and pushing downward the calloso-marginal fissure. It measured one and three-quarter inches antero-posteriorly, and one inch vertically. By the time the brain was removed from the head and placed in a basin, a tumor, of which this mass was the edge, had been spontaneously and almost entirely enucleated from the left hemisphere by the disturbance caused by the manipulations. When removed, it measured three and three-quarter inches by two and three-quarter inches, the long axis being transverse. (Figs. 3 and 4.) It occupied a position directly under the motor area; the cortex of the motor area, which lay over it, was one-third of an inch in thickness, and to the eye entirely normal. The walls of the cavity in which the tumor lay were lined with a thin layer of brownish, semi-fluid substance. No large vessels penetrated it excepting at the protruding mass next the falx, where two very large veins lay on its surface. Whether the tumor had protruded into the lateral ventricle during life, it is difficult to say. When the tumor had escaped from its cavity, this latter was seen to communicate with the lateral ventricle; but this might readily have been from a tear in handling

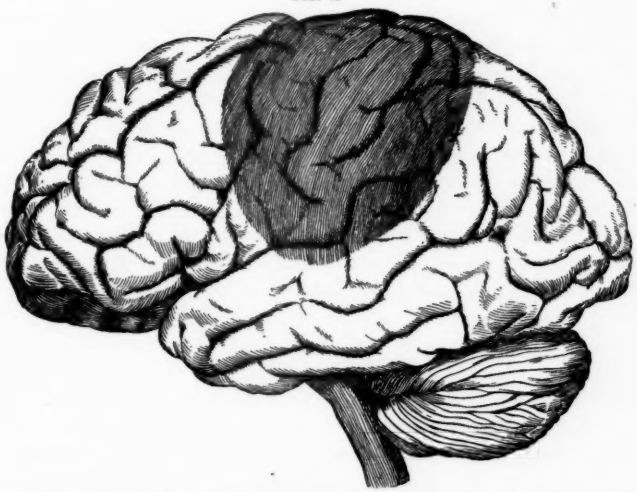
the brain, as it was very soft in all the region bordering on the tumor for an inch or more. Both ventricles were moderately dilated and

FIG. 3.



Inner surface of brain, showing site of tumor, its centre being softened and blackish in the darker area.

FIG. 4.



External surface of the brain, showing the site of the tumor which lay under the cortex

filled with the cerebro-spinal fluid, which had in it few, if any, flakes or other evidences of disease. In the spinal canal, while removing the brain, about an ounce of fluid appeared to be present; the cord appeared to be

normal. On turning the brain upside down, the floor of the third ventricle was extremely thin, and the corpora quadrigemina tore apart with great ease.

Description of the tumor. Its size is stated above. It consisted of a mass of about the consistence of normal brain tissue. Its upper extremity, where it protruded through the hemisphere on its median aspect, was of a blackish color—as also was one other spot as large as a cherry—this color being due to hemorrhages which had taken place in the interior of the tumor. The opposite extremity of it was quite œdematous. The whole tumor was nodulated. Its weight was four and one-half ounces.

Prof. W. M. L. Coplin examined the tumor microscopically, and reported as follows:

"The tumor itself is made up of sarcomatous elements differing but slightly from what is recognized as glioma. The condition of the brain substance is very interesting. The perivascular lymph channels are more or less occluded, and the nutrient vessels no longer patulous, but surrounded by areas undergoing degenerative processes. There was no infiltration of the walls of the cavity in which the tumor lay."

Remarks by Dr. Lewis.

The tumor, as found at the autopsy, did not occupy exactly the position where it was thought probably to be situated. The pressure on the optic tract and other signs of interference at the base of the brain led to the belief that the growth was situated deep in the left mid-brain, and in consequence of this belief it was advised that no operation be performed. Had the patient been operated on and the trephine placed over the motor area upon the left side it is doubtful in my mind whether the tumor would have been recognized, and even if an incision had revealed its presence it is difficult to see how a mass measuring two and three-quarter by three and three-quarter inches, situated one-third of an inch beneath the cortex, could have been removed without destroying all, or most, of the overlying motor cortex. It is also difficult to suppose that the mass could have been removed by way of the longitudinal fissure at the point where it approached most closely to the median line of the left hemisphere.

Remarks by Dr. Keen.

A number of points in connection with this case are instructive. The cause of the tumor was very probably the fall of twenty feet. It is almost certain from the marked unconsciousness following the accident that he struck his head, and as the post-mortem showed that his skull was very thin it is possible that this traumatism may have been more serious than to a person with a skull of usual thickness. On the other hand, it is equally possible that the thinning of the skull may have been produced later by the tumor. However this is, the lesson to be learned from the

case is not to forget that such trauma may be followed by a tumor such as a fibroma, as in a case which I reported some years since (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, September, 1888),[1] or sarcoma, as in this case.

The long time which elapsed after the fall before the brain trouble began is also a caution to us not to forget the remoter effects of such injuries. Even much longer periods than this have elapsed in cases of abscess, and the present case shows that we ought to remember such possibilities in all instances of traumatism. Moreover, had this been borne in mind the error of diagnosis as to the beginning trouble with his leg, for which a brace was ordered, would have been avoided.

We debated very seriously the question as to whether the tumor was a sarcoma arising from the traumatism, or a tubercular tumor or tumors, or possibly a syphilitic gumma. The latter, both from the history and therapeutic tests, was rejected, and the question lay between tubercle and sarcoma. The early involvement of all the various centres on one side, such as leg, arm, and face, convinced us that the tumor was either multiple or else was very extensive, and this, as well as the supposed position of the tumor, deterred us from any operative procedure, especially as his condition, when I first saw him, was such that we judged his life would not be long, and the effect in case of operation was not hopeful. Had we trephined we should have come down upon normal brain tissue. The tumor lay one-third of an inch below the cortex, was nearly of the consistence of the cortex, and would scarcely have been discovered by puncture. Reflecting upon this and some other similar cases, I have thought that we might sometimes use to advantage in the brain the procedure we constantly employ elsewhere, viz.: Make an incision, one to two inches long, and, say an inch deep, and draw asunder the edges of the opening in order to see whether there is anything abnormal beneath the cortex. I have never yet done so, but shall certainly try it in the first case suitable for such a manœuvre. Had we been able to reach it, through a large opening, it is doubtful whether its enucleation would have been a feasible step, in spite of the brown semi-fluid débris which prevented any connection between the tumor and the surrounding parts—so that at the post-mortem it dropped from its cavity like an egg from its shell. Prof. Coplin especially examined the question of infiltration of the neighboring brain tissue, which constituted the wall of the cavity in which lay the tumor, and was satisfied that there was none. This, of course, is rare in sarcoma, but should not be forgotten in other cases, as it would influence our determination to attempt a removal.

[1] This patient is still alive, with somewhat better sight and very infrequent ep leptic attacks He has gone as long as a year without any.

The variations in the degree of paresis in the arm and leg, *inter se*, and of the arm at various times, and the variations in the strabismus and sight are all extremely interesting and instructive.

Ferrier has already pointed out that pain on percussion over the site of a tumor is of more value as a means of locating such a lesion than spontaneous pain. Although in this patient this varied to some extent, yet, as a rule, pain on percussion was much more noticable over the site of the tumor than spontaneous pain.

A curious fact which Dr. Lewis tells me he has observed in another case of cerebral tumor, and which Dr. Thomas G. Morton has also observed in other cases, is the pain either at the ensiform or at the mid-sternum, particularly upon flexing the head. How to explain this I do not know. It may prove hereafter to be a sign of some value.

(To be continued.)

ON SOME UNUSUAL NEW GROWTHS OF THE VULVA.

By R. W. Taylor, M.D.,
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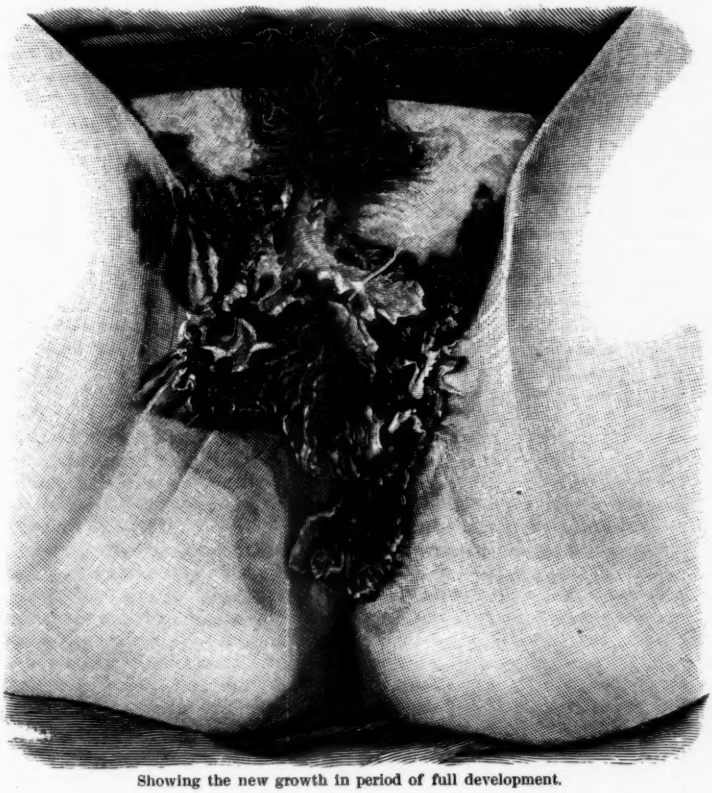
Under the title "A Hitherto Undescribed Form of New Growth of the Vulva" I published an essay in the issue for February, 1890, of this journal, in which I reported at length one case and briefly alluded to a second. In the present paper I report two further cases, and in order to bring out their features and phenomena conspicuously I reproduce a portion of my published description of the first case. It will be seen that my second case is clinically and microscopically similar to the first one, but that the third case differs strikingly and radically in its objective phenomena and clinical history from the first two cases. To reconcile this seemingly unscientific classification I may say that while my clinical studies convinced me that Cases I. and II. were remarkable examples of an unusual and until 1890 undescribed form of new growth of the vulva, the microscopist tries to teach me much against my will that in Case III. the pathological process is precisely similar to that presented by Cases I. and II. Seeing that it is impossible with this limited number of cases to draw absolute conclusions or to venture upon generalization, I simply report the cases in such a manner as to bring out their salient features, adding such comment as my study and observation have led me to.

Case I.—S. L., a female domestic of loose habits had suffered from chancroids and suppurating buboes, which were treated by me over a number of years, but no history of syphilis could be obtained, even

after most careful questioning on many occasions and after thorough examinations of her body. Subsequent to her thirty-fifth year she had suffered from vulvitis, which she had ascribed to her former chancroids. Intemperance and carelessness of person undoubtedly were largely contributing causes. When she was forty-five years old she again entered Charity Hospital, in fairly good general health, and remained under my observation until her death, which occurred nearly three years later. We found the vulva the seat of a maroon-colored flat new growth which extended to the pubes and right inguinal region and encircled the anus.

FIG. 1.



Showing the new growth in period of full development.

The appearances of this peculiar new growth are well shown in Fig. 1, which was made about two and a half years after the date of its beginning. It will be seen that the normal appearances of the vulva are wholly lost. There are no traces of the labia, large or small. The clitoris is represented by a central mass of cicatricial tissue, and the introitus vaginæ looks like a ragged slit. The perineum is also invaded

with processes of the new growth jutting backward. Extending from the vulva the disease is seen to invade the pubes and the right groin, and to extend downward over the skin of the fork of the thighs. In no place is there evidence of tumor-like formation, as the new growth is everywhere developed *en surface;* in other words, it is flat in structure. The surface of this neoplasm is of a maroon or chocolate color, with considerable glossiness. At times this morbid surface was perfectly dry, and at others it gave issue to a thin, scanty, reddish serum.

The parts present a firm but decidedly elastic feeling, as if the new growth possessed a fair amount of density. To the eye and to the finger-tip it is evident that the vulvar and extra-genital portion of the new growth is uneven and thrown into slight irregular folds, a condition due undoubtedly to the natural conformation of the parts. Radiating from the clitoris region is a quite well formed sheet of cicatricial tissue, and scattered on the outer and upper parts of the new growth are irregular shaped islets of the same. Upon the lower part of the vulva and toward the perineum the mode of extension of the new growth is well shown. On the right side it juts outward by an abrupt semicircular elevated margin, while on the left the morbid tissue ends in a similarly sharp festooned outline. In the upper and older parts of the morbid area the sharpness of the margination is lost in cicatricial tissue, and elsewhere as a result of treatment adopted. At the time this drawing was made the morbid process stopped at the orifice of the vagina, which, however, was somewhat contracted. Toward the end of life the new growth became so copious and firm in this region that this orifice would only admit, and then with considerable pain, a soft bougie of about No. 26, French scale. There was never any evidence of stricture of the urethra, but in another case the lumen of that canal was much contracted. Besides the foregoing appearances, there was evidence in life of a marked condensation and contraction in all of the affected parts, which increased very slowly and imperceptibly. The salience of the vulva was, in the end, wholly lost, and examination of the new growth *en masse* showed that it was quite firmly adherent to the deeper parts. When the patient was on her back the genitalia had a peculiar, flat appearance, and as she stood up it was evident that the labia majora no longer protruded between the thighs.

This new growth began as a thickened, slightly elevated patch, of deep-red color, upon the left small and large labia. From this region it extended by peripheral increase toward the vaginal orifice, over the clitoris and upward and downward on the right side, while on the left it jutted down to near the anal orifice. The increase in area took place slowly, and as the new morbid tissue was formed, the older portions remained without any visible change, ulcerative or reparative. A slight amount of heat, pain, and pruritus was felt at irregular periods. The local symptoms, however, were for a long time so mild in character that the patient made little complaint. She could sit, walk, move, and lie down with little discomfort. Later on this was all changed.

As the new growth extended it seemed to involve and infiltrate the whole thickness of the mucous membrane and the connective structures beneath them, and to convert them into a firm, elastic tissue.

This form of new growth, it seems, is not peculiar to mucous membranes. By its peripheral increase it involves the skin, as is well shown in Fig. 1, and its progress on this tissue may be accurately

studied. We find on the integument the same flat form of new growth seen on the mucous membranes. The surface is smooth, even, and glossy, and the color a decided maroon. The elevation of the patches is from one to three lines, and they end by a well-defined curved or festooned border, which, rounding off sharply, is lost in the sound skin.

The elasticity of the infiltration remained for indefinite periods, and was slowly and gradually replaced by a marked condition of condensation, particularly in the central vulvar region. The result was that the conformation of the genitals was more and more destroyed.

As the new growth infiltrates the tissues it is noticed that, as condensation takes place, the morbid areas become more or less attached to the bony or aponeurotic parts beneath, until, in the end, they may feel as if soldered to them. The foregoing conditions were frequently observed. Along the vulvar sulcus, where the disease originally began, the tissues presented to the finger-tip an almost brawny sensation, whereas, at the periphery of the new growth, well-marked but still decidedly firm elasticity was noted.

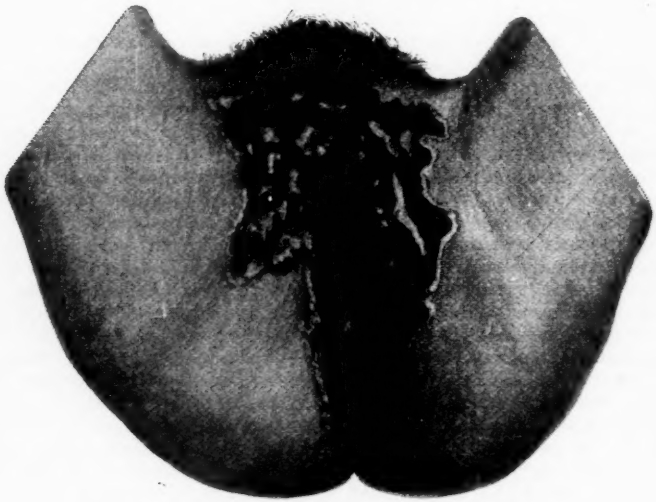
Let us now study the superficial appearances of this new growth during its entire course. As I have said before, the surface of the morbid parts was always rather glossy, sometimes dry and again slightly moist, always, however, presenting a delicately raw appearance. On the mons Veneris and the thighs evidences of healing were very often noted. This process usually began in spots of pearly cicatrization, which increased under favorable circumstances, until sometimes large healed areas were produced. But the cicatricial tissue always showed a great lack of vitality and endurance. So long as great care was observed, and the parts were kept scrupulously clean and dry, the healed surfaces might remain intact. But any inattention (from indifference of the nurse, or during the menstrual epoch, or a drunken debauch) was inevitably followed by retrogression. It was surprising to see how rapidly the cicatricial tissue melted away. A part which was pretty well healed one day might a day or two later present the most typical morbid appearance. It was always evident that in healing, though the superficies of the morbid tissue became cicatrized, the deeper parts remain unaltered. Thus the disease oscillated between a cicatrized condition and the reverse month after month, in spite of the most careful treatment.

The tendency to healing, however, was only observed in the juxtagenital parts just mentioned. At no time could we produce reparative changes on and within the vulva proper. There the secretions and the close coaptation of the parts wholly prevented cicatrization, even though the greatest care was used in placing interposing absorbent dressings. As time went on, the condensation of the vulvar and vaginal tissues was so great that the vulva was converted into a raw slit of tough tissue, the lips of which were drawn more and more tightly together and the vaginal orifice almost completely stenosed. This state is well shown in Fig. 2, which was taken about three months before death. It is interesting to study this picture in connection with Fig. 1. It will be seen that in rather more than two years the disease has extended somewhat in an outward and backward direction. It is evident, however, that the luxuriance of the infiltration shows itself by involving the tissues in their whole thickness and depth, rather than by peripheral extension. This same feature (as well as all others) was observed in a case seen by me about ten years ago, the history of which was unfortu-

nately lost. The new growth showed a tendency to remain localized to the vulvar and juxta-vulvar regions.

During its whole course this new growth showed no tendency to luxuriate upon the surface. There was never any evidence of tumor-like formation, since the infiltration never reached a greater height than three lines. There is never any evidence whatever of ulceration, and though the morbid growth may in more or less degree become less salient, the decrease in its height is due to the slow and almost imperceptible melting away of its superficies and to its inherent slow contractile tendency. Further than this, it was observed that in the recesses of the vulva, where the lesion was thrown into anfractuosities, there was not the slightest ulceration between its clefts and folds. It never presented any appearance resembling papillomatous outgrowths.

FIG. 2.



Showing the condition of the genitals three months before death.

Though this inflammatory and infiltrative process lasted many years, it did not seem to involve the contiguous lymphatic system. In both of my early cases and in the second reported in this essay the ganglia were slightly, if at all, larger than normal, but in none of them was there at any time any evidence of inflammation. There was an entire absence of erythematous and erysipelatous complications.

The disease shows no tendency whatever to malignant degeneration, and of itself seems to have no direct influence upon the general economy.

As I have already stated, the local symptoms were for a long time mild in character, and the patient made little complaint. Gradually, however, as the disease progressed without any abatement, the soreness in the parts was replaced by pain, particularly on the slightest movement. Walking became almost impossible, the erect position of the body could only be maintained with the greatest difficulty and discom-

fort, and as sitting became painful and almost impossible, the patient was forced to take to her bed. Even in the recumbent position all movements caused uneasiness and pain. The swollen, contracted, and excoriated condition of the vulvar sulcus impeded urination; the stenosis of the vaginal orifice prevented the use of cleansing and soothing injections and impeded menstruation, while the rigidity and irritated condition of the parts prevented the application of absorbent tampons. In this hopeless, bedridden condition, the patient was a pitiable object. Her sufferings and worriment of mind led to utter demoralization, hopelessness, marasmus, and death. The same sad fate overtook the case already alluded to, whose history was lost.

CASE II.—A widow, aged twenty-five years, of remarkably healthy parentage, came to Charity Hospital in January, 1891. She was well developed and tolerably strong, and measles in early infancy was the only sickness she could remember. When twenty-two years old she was married to a sailor, who seemed to her to be a perfectly healthy man.

FIG. 3.

Showing the new growth in its active stage.

In the second year of her marriage (fully four months after the accidental death of her husband) she noticed a small pimple in the right inguinal fold at about the centre. This pimple gave her no pain and discharged no pus. In three months it had increased and formed a circular patch one and a half inches in diameter, with an exulcerated surface, and raised about an eighth of an inch above the normal plane of the skin. This new growth steadily increased in size, running down on the outside of the right labium majus, and involving it and the corresponding nympha, then gradually it extended downward and backward, encircling and involving the anus well in toward the sphincter.

From this region it ran up the outer side of the left labium majus, attacking and destroying, or better melting away, part of it and then the whole of the corresponding nympha and ending at the left inguinal fold. The appearance of the parts is very clearly shown in Fig. 3. The new growth was sharply marginated by an elevated border nearly a quarter of an inch in height, beyond which the skin was somewhat pigmented, but seemingly healthy. The surface of the new growth was purplish-red in its oldest parts and at the periphery, and of a dull pinkish-red in its centre. The vulva was a raw oozing slit, but it would admit with little uneasiness the first joint of the index finger. The anus was wholly involved, its tissues much condensed, and it was raw, sore, and painful on defecation. The surface of this new growth (which I recognized in an instant, was similar in its nature and character to that of Case I.) was rather more uneven and more mammillated than in the previous case. It varied considerably, however, since sometimes it was smooth and sloping, and then again it would become less even. It gave issue to a scanty serous and sero-sanguinolent discharge. In its early months this new growth was the seat of an ephemeral throbbing pain, but in general, though it caused some discomfort and uneasiness on urination and defecation, it could not be said to be painful.

This patient was a sensible, truthful, virtuous woman, and I am confident that the information she gave us was as near the truth as she could give it. I tried many times in vain to elicit facts pointing to a syphilitic origin of this new growth. She never had any vulvar lesion, nor had she had any vaginal discharge. Repeated careful examination of her body failed to arouse any trace or suspicion of syphilis. On the inside of the right thigh were some irregular brownish spots of pigmentation, which I think were due to varicosity of the veins, which was then well marked.

Early in her hospital days we gave this woman a thorough and vigorous anti-syphilitic course of treatment as a tentative measure. She bore the medication very well, but her vulvar lesion remained unaffected. We tried all sorts of local applications, antiseptic, astringent, and stimulating, without much success. We observed signs of improvement, and then came relapse. In this way about ten months slipped by, then, as a last resort, mercurial ointment was applied to the surface, and healing slowly but surely began. In two or three months the parts were fully cicatrized, but the introitus vaginæ was lessened in diameter, and the anus was rather rigid and less distensible than normal.

I am disposed to think that the auspicious outcome of this case was largely due to the woman's good condition, her previously regular life and habits, and to her youth. In her we had a healthy condition of the system to aid us in our therapeutics, while in the first case the patient was a woman given for long years to debauchery and all excesses.

I am strongly of the opinion that the early application in this case of hot antiseptic and astringent douches, the careful aseptic condition which the parts were kept in, and the stimulating applications, had much to do toward a cure, and that these medications paved the way for the healing process by means of the mercurial ointment. The fact that healing occurred by this agent warrants the suspicion that perhaps the affection

was syphilitic in its origin, but then we must remember that many simple non-specific infiltrations and thickenings are dissipated by local mercurial action. In other words, we are not warranted in assuming that the cure or the dissipation of lesions by mercurial action is the touchstone of diagnosis. Perhaps the woman had syphilis. I certainly cannot say so, nor have I ever seen such a new growth caused by syphilis. Still, that infection is infinite in its manifestations.

CASE III.—L. S., colored, aged twenty-two years, was admitted to Charity Hospital in March, 1891. In early life she had suffered from

FIG. 4.

Showing the cauliflower appearance on the surface of the tumor.

measles and mumps, but had no other sickness until puberty. It was utterly impossible, owing to the patient's ignorance and bad memory, to get a satisfactory history of syphilitic infection. There were scattered over the body certain small maculations which were deeper in tint than her café-au-lait colored skin, which gave rise to the suspicion that they were the sequelæ of a previous papular eruption, but her story concerning them was very vague. She had, however, well-marked mucous patches

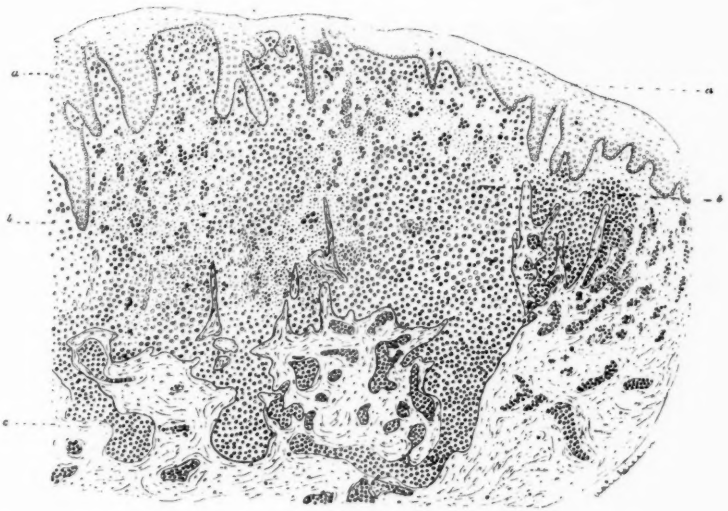
on the fauces, and she suffered from nocturnal rheumatoid pains. These lesions and symptoms, taken in combination with generalized adenopathies, convinced me that she was suffering from syphilis of probably two years' duration. She entered the hospital for vulvar tumor and ulcerations, which are well shown in Fig. 4. According to the patient's account she first noticed the swelling four weeks prior to her entry into the hospital. It is probable, however, that it began rather earlier than at that period. Upon examination it was found that the left labium majus was much hypertrophied in so far that it projected downward for fully two inches, and was correspondingly increased in breadth. The surface of this swelling was irregular, warty, and granular—so much so that several of the hospital staff had diagnosticated it as hypertrophied warts. Firm pressure showed that the mass was of almost cartilaginous hardness and that the morbid process was greatest in the deepest portions of the labium. On the inner surface of the labium were several well-marked chancroids, and there were two or three smaller ulcers on its fellow of the opposite side. The right labium was somewhat œdematous and hyperæmic. In the right groin several ganglia had gone on to suppuration. My diagnosis was indurating œdema of syphilitic origin. The warty appearance of the skin was simply an accident due to irritation in an uncleanly subject. Antiseptic douches were used in the vagina and vulva, and mercurial ointment was freely applied to the vulvar mass. Internal mercurialization was also carefully pushed. This treatment, followed carefully for six weeks, showed no effect whatever on the new growth. I resolved therefore to remove it with the knife. The incisions were made sufficiently deep to remove the mass, and the flaps were so formed that a nearly symmetrical labium was left after the healing, which occupied a month. The woman remained comfortable and well for about fifteen months, when she again entered the hospital. At this time she had a similar and smaller swelling involving the right labium majus, which on its mucous surface presented several large chancroids. This tumor, which like its predecessor, gave rise to no pain, nor much discomfort, was also removed together with a smaller one seated on the lowermost part of the scar of the first tumor. In six months the parts were sufficiently firmly healed to allow the departure of the patient.

Microscopical examinations of these two tumors were made for me by Dr. Van Gieson, who to my utter suprise reported that in structure they presented exactly the same appearances as did the new growths in the two preceding cases.

Microscopical examination and pathology. Portions of the new growths of these three patients were examined in their whole thickness by Dr. Van Gieson, by whom the drawings Figs. 5 and 6 were made. In all these cases the microscopical appearences are thoroughly identical. The tissue was composed of three layers: (1) a superficial layer corresponding to the cutis, which is irregularly thickened by a considerable ingrowth of the Malpighian layer: (2) beneath this, replacing the corium and a portion of the subcutaneous tissue, is a layer of tissue apparently identical with granulation tissue, except that in places it contains large numbers of free red blood-cells; and (3) a third layer corresponding to the deeper subcutaneous tissue, whose lymph spaces are filled and distended with small round and small polyhedral cells (Fig. 6).

Where the nodule became continuous with the surrounding skin the

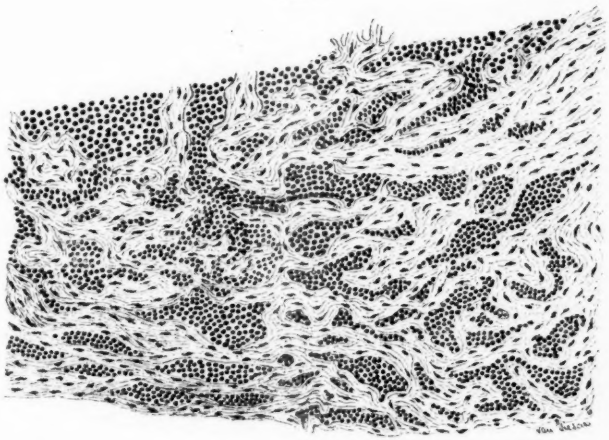
FIG. 5.



Showing a topographical view of the lesion.

a. Epidermis irregularly thickened by ingrowths of the inter-papillary portions of the rete Malpighii. *b*. Layer of granulation tissue. *c*. Lymph spaces of the deeper subcutaneous tissue filled with granulation tissue.

FIG. 6.



Showing the distention of the deeper subcutaneous lymph spaces with the granulation tissue.

cutaneous lymph spaces were also filled with small round and polyhedral cells.

There were no bacteria of any kind in any of the numerous sections.

The results of this examination, therefore, seem to warrant the opinion that this chronic lesion consisted of simple inflammatory tissue.

ETIOLOGY.—When I studied the first case over a period of several years, I felt tolerably certain that syphilis was not an underlying cause of the vulvar lesion. In justice to Dr. Van Gieson, I must here state that the microscopical appearances, while showing simply inflammatory tissues, left in his mind a suspicion that perhaps the new growth was of remotely syphilitic origin. To-day, in the light of the developments in the microscopical studies of the third case, which occurred in a syphilitic subject, I also must express my misgivings.

In the second case, which very closely resembled the first, I think I can positively say that a syphilitic origin is out of the question.

The third case is certainly the stumbling-block in this study. In this the lesion is tumor-like and wholly different in its appearance and in its clinical history and course from the other two cases, yet the microscope tells us that its tissue is precisely like that of Cases I. and II. The elder Hebra used to say that when a microscopist was at variance in what he saw with the clinician, the latter was the more certain to be correct in his views, based on observation and study of objective and subjective phenomena. In these cases my studies lead me to think that Cases I. and II. are essentially identical in all particulars, and that Case III. is wholly and almost indisputably different as to its origin, nature, and course, it being a rather unusual instance of syphilitic sclerotic œdema. Yet the microscope tells us they are all similar. I must, therefore, leave the question in doubt, since it can only be settled by the clinical and microscopical study of cases yet to be observed. In the study of these three cases I have done all that I can do, and I shall hope to hear from other observers who may have similar cases.

DIAGNOSIS.—The features of the first two cases might be mistaken for serpiginous chancroid, but close observation shows that the morbid process is essentially a hyperplasia and not ulceration. I know of no classical syphilitic process which resembles it. The diagnosis of lupus may occur to the mind, but this affection is different in its nature and course. So well marked and characteristic are the appearances of this new growth in Cases I. and II. that anyone familiar with it will readily recognize it. The appearances and history of the growth in Case III. are so striking and characteristic that anyone familiar with the vulvar lesions of syphilis will readily recognize it as indurated or sclerotic œdema. It might, however, be mistaken for hypertrophic vegetations, or even epithelioma, but the history and pathological appearances exclude these affections.

TREATMENT.—This has been so well gone over in the consideration of Cases I. and II. that there is little need of further detail. The physician's therapeutical armamentarium will be sorely taxed, and if he is fortunate enough to bring about cicatrization by any means whatever he is to be congratulated.

In dealing with growths such as are shown in Fig. 4, a wide experience has convinced me that it is well to try a vigorous local and general mercurial treatment. This may perhaps bring about resolution of the tumor; but when it fails, as it frequently does, the best procedure is ablation, carefully performed, with a view of leaving the parts as nearly like normal as possible.

40 WEST TWENTY-FIRST ST., NEW YORK.

PROTOZOA AND CARCINOMA.

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ANYONE surveying the literature that has accumulated during the last few years on protozoa and their relations to malignant tumors and especially to carcinoma, will no doubt be struck by the apparently hopeless tangle of contradictory observations and theories. A closer scrutiny, however, discloses certain fundamental lines along which all this mass of research and speculation can be arranged.

For the last three years I have been steadily engaged in a study of cancer with regard to the question of protozoic parasitism and certain other points of its histology. More than sixty carcinomata from various regions of the body have been examined, besides numerous sarcomata and non-malignant growths. The pieces of tumor were in every case taken immediately after removal, and in many instances small pieces of tumor were removed before the operation in order to insure fixation of the tissues in a state approximating as closely as possible to that of actual life. Pieces of each tumor were invariably dropped at once into various fixing solutions, one of these in the last year being always a concentrated bichloride of mercury solution according to Heidenhain or Hansemann. They were then in the usual manner hardened, imbedded in paraffin or celloidin, cut with a microtome into thin sections varying from 1 to 10 μ, and stained according to numerous methods. Thus thousands of sections were examined and compared. I desire to express here my grateful obligation to Drs. Willy Meyer, Kammerer, Krug, Gerster, and F. Lange, to whose kindness I am indebted for the greater part of this valuable material. I trust to be enabled at not too

distant a date to submit some slight contributions to our knowledge of the more minute histology and pathology of cancer. In the following lines I propose to briefly sketch the present status of the question concerning the relations of protozoa to carcinoma on the basis of a careful consideration of the publications of others and of my own work.

The two fundamental questions that claim our attention are:

1. Has the presence of parasitic protozoa in carcinoma been demonstrated beyond possibility of doubt? and

2. If so, has any etiological relation been established between these parasites and the neoplasm?

The existence of certain pathogenic protozoa is now a sufficiently well established fact. The *plasmodium* (*hæmatophyllum*) *malariæ*, the *amœba* of dysentery and certain other forms of enteritis, the *coccidium oviforme* of the rabbit, are well-known instances. All these are, however, easy of recognition. The amœbæ can be traced in the dejections whilst still alive, and by their movements and peculiar structure are not readily confounded with any other cells. Once observed during life they can without much difficulty be recognized in the stained and hardened tissues.

Again, *amœbæ* are not intra-cellular parasites, and *coccidium* has so well-marked a cycle of development, and is in the encysted state so conspicuous and characteristic an object, that a mistake in diagnosis is hardly possible. In the *hæmatophyllum malariæ* we have indeed an intra-cellular parasite, and for some years the controversy was maintained with much earnestness whether or not it was a true parasitic organism or some form of degeneration of the erythrocyte. The parasites can, however, readily be observed while living and moving within the red blood-corpuscles. There is, moreover, in a certain sense a specific stain, inasmuch as methylene-blue does not stain the blood corpuscles while it does stain the plasmodium. A tolerably well marked developmental cycle has also been demonstrated, thus leaving no possibility of doubt of the protozoan and parasitic character of the plasmodium.

But on what indisputable basis can we establish the diagnosis of protozoan parasites in cancer? We have to deal here with conditions the complexity of which is only just beginning to be recognized. The observation of the living tissues is encompassed by almost insurmountable difficulties, and we are compelled to depend almost exclusively on a study of artificially fixed, hardened, and stained specimens. A comparison of sections of different pieces of the same tumor fixed respectively in Flemming's solution, picric acid, alcohol, and bichloride of mercury will readily demonstrate the widely different appearances resulting from different methods of fixing and hardening. Noeggerath,[43]*

* The numbers refer to the table of references appended to this paper.

Gibbes,[28] and others have already pointed out this source of error, and I would again urge that only such results are comparable as have been obtained by precisely the same methods of preparation.

Besides the artefactions due to the processes of preparation, the cell metamorphoses must also be taken into account. The more closely the subject is studied the more the conviction is forced upon the observer that numerous alterations, regressive as well as progressive, are continually going on in cancerous tissues. A wide field for research is open here, and its investigation has as yet not passed beyond the very first stages. Degenerations of all kinds (hyaline, colloid, gelatinous, horny, etc.), vacuolization and dropsy of the cell bodies, irregularities in the distribution of the chromatin, dispersion of chromosomes and fragments of such during and after the karyokinetic process, asymmetric mitosis, cell invaginations, intra- and inter-cellular invasion of red blood-corpuscles and leucocytes, either normal or variously degenerated—all these and numerous other irregularities must be most carefully studied in this connection.

We must take into consideration also that no specific stain for protozoa has as yet been discovered. It can readily be shown that cells manifestly degenerated, whose derivation from healthy cells is made apparent by a full line of intermediate stages, will stain differently from healthy cells with many, or all, of the usual aniline or hæmatoxylon dyes. Metachromatism, therefore, can by no means be depended on in every case as a safeguard against error.

The bacteriological methods, so marvellously successful with bacterial microbes, have thus far entirely failed in the case of protozoa. In spite of numerous and determined efforts no method of culture has as yet led to any practical results.

How, then, can we arrive at the diagnosis of a protozoan parasite in cancer? The difficulties seem almost insurmountable. No methods of pure culture, no specific stain, hardly a possibility of examining living tissue, and a multitude of cell metamorphoses in the tumor which tend to simulate parasitic cell-enclosure.

According to the present very imperfect knowledge of everything connected with this subject the answer to the question can, in my opinion, be only this:

We are justified in making a diagnosis of a protozoan parasite in cancer only when its morphological attributes and its reaction toward stains are such as to preclude all possibility of being explained by any of the numerous kinds of cell metamorphosis or other irregularities of cell life hinted at above, and when, in addition thereto, a sufficiently well marked and well established developmental cycle can be demonstrated.

If now the work done within the last few years on protozoa in carcinoma be tested by this standard, it becomes apparent that by far the

larger part of what authors have claimed as parasites cannot unconditionally be accepted as such. It will be readily comprehended, too, why so little uniformity of results has been obtained. While some observers find the principal seat of the parasite within the nucleus, others deny the existence of intra-nuclear bodies altogether and locate the protozoön principally in the protoplasmatic cell body or between the cells. A glance at the illustrations furnished by Wickham,[82] Steinhaus,[71] Foà,[25] Podwyssozki and Sawtschenko,[56] Soudakewitsch,[70] Sjöbring,[69] Pfeiffer,[54] and others will demonstrate what widely differing objects were claimed as parasites, though it cannot be denied that certain typical forms reappear in the work of nearly all of these authors. While certain authors—Albarran,[2] Malassez,[41] Darier,[17] Wickham,[82] Ramsay Wright,[84] Russell,[63] etc.—are convinced of the abundant and constant occurrence of protozoa in carcinoma, others, among whom may be mentioned Borrel,[4] Firket,[24] Klebs,[35] Ribbert,[58] Shattock and Ballance,[67] are inclined to deny their existence altogether, and explain the histological appearances which have been classed as protozoa, as due to some of the numerous cell irregularities which are known to occur in cancer. Particularly Török,[78] in a very careful study of the subject, has recently pointed out where some of the prominent adherents of the parasitic theory have, in his judgment, been at fault. Still other investigators, such as Steinhaus,[71] Podwyssozki,[55] Stroebe,[74] Siegenbeck van Heukelom,[68] reserve their judgment, and while admitting that much that has been regarded as parasitic is due to some form of cell metamorphosis, still contend that certain cell enclosures which they picture can best be explained on the supposition that they are stages in the development of a protozoan parasite.

As regards my own work on the subject and its results, I hope on a subsequent occasion to give a more detailed account. I wish here to state very briefly that in all the very large mass of material examined, nothing has been observed but what could easily be explained without having recourse to the assumption of protozoan parasites. The majority of the appearances described and portrayed by other investigators were recognized, but in no case could I convince myself of the protozoan character of the objects, according to the principle enunciated above. On the whole I can subscribe to the views expressed by Török.[78]

Within the last few weeks Korotneff's investigations[40] have appeared. He describes a new parasite, *Rhopalocephalus carcinomatosus*, with all its stages of development, and regards it as specific in cancer. I have as yet not had time to follow his methods and attempt a verification of his statements. The material on which he bases his observations is extremely limited. Nevertheless if competent observers will substantiate his results, it seems probable that here we have a true parasitic protozoön in cancer, fulfilling all the conditions required by our fundamental principle (*cf.* Korotneff's Figs. 1, 2, 15, 19, 21, 46, etc.).

Somewhat similar observations, though attained by different methods, have also been published by Sawtschenko,[64] and I am inclined to think that here also we have to deal with a true parasite. The observations of Burchardt[8] may possibly also come under this head.

As a result of the entire discussion it seems safe to say that while the large mass of cell-enclosures and intra-cellular bodies prematurely regarded as protozoa have no claim to this title, it seems highly probable that protozoan parasites can and do occasionally occur in carcinoma.

What relation have protozoa to carcinoma? Is there an etiological connection, and are we justified in the present state of our knowledge in assuming a parasitic origin of cancer?

At this point of the inquiry it becomes important to consider if the investigation of protozoic parasites throughout the animal kingdom has thus far brought to light any tumors due to parasitic action that can be classed as true cancer, or at least as analogous to it.

It would seem that the animalcules in question are in some instances perfectly harmless cell-parasites. It is true, the host-cell is usually destroyed, but there is no injury to the surrounding tissue nor to the organism as a whole. As examples of this may be cited the *Klossia helicina* in the snail-kidney, and the *monocystis* forms in the testicle of lumbricus. In other cases the presence of the parasite causes mechanical and chemical irritation. We must suppose that the *plasmodium malariæ* destroys its host-cells, and, tainting the blood with the products of its metabolism, produces the characteristic symptoms of malarial fever.

As an instance of the extra-cellular parasite, the amœbæ of dysentery presumably produce their characteristic symptoms by chemical irritation as a consequence of their peculiar metabolism.

There are, however, certain forms of protozoa which cause distinct proliferation of the surrounding tissue and thus produce well-marked tumors. To Pfeiffer we are indebted for the knowledge of such tumors caused by *micro-* and *myxo-sporidia*; and the tumors caused by the various forms of *coccidia*, particularly by the *coccidium oviforme* of the rabbit, are brought forward again and again as a convincing argument by the unconditional adherents of the parasitic theory of cancer.

Delépine and Cooper[72] have very recently shown that the *psorospermosis* or *gregarinosis* of the rabbit in very numerous instances causes no morbid symptoms whatsoever, and interferes neither with the life nor the health of the animal, though after death numerous characteristic fibrous nodules can be found disseminated through the liver and intestines. Sometimes, however, and owing to conditions as yet obscure, the coccidial invasion causes morbid symptoms, and among others tumor-like nodules, particularly in the liver. Such tumor-nodules I have carefully examined. I find in accord with most authors on the subject,

besides considerable new-formation of connective tissue, infiltration of leucocytes and broken-down cell material, a slight but distinct though not always constant proliferation of epithelium, principally of the bile-ducts.

Of tumors caused by *micro-* and *myxo-sporidia* I have no experience, but conclude from the descriptions given by Pfeiffer that they do not materially differ in any fundamental point from those caused by *coccidia*.

Are we justified in considering such tumors as analogous to cancer? It is well to call to mind here that cancers should not be considered as a mere proliferation of epithelial cells. If such proliferation were to be considered the distinctive feature, then every acuminate condyloma, every papilloma, every adenoma would have to be classed as carcinoma—tumors in which the epithelial proliferation far surpasses in magnitude anything produced by the comparatively insignificant proliferation due to protozoa. It is necessary continually to keep in mind that the distinctive characteristics of cancer are, not the mere fact of the proliferation of epithelium, but the new-formation of epithelium and stroma* in a typical manner; the power to produce metastatic tumors in distant parts of the body which faithfully and under all circumstances reproduce the structure of the primary tumor, entirely independent of the character of the tissues in which the secondary nodules are seated; and, thirdly, the general cachexia which, according to the investigations of Klemperer[36] and of Müller,[46] may possibly be due to toxic products resulting from the morbid metabolism of the cancerous tissues. With this view of cancer before us we must come to the conclusion that the tumors thus far recognized as undoubtedly due to protozoic influence have nothing in common with true carcinoma, are in no way analogous to it, but present all the characteristics of chronic irritation or inflammation.

Experiment and observation have abundantly proved that ordinary epithelium when floated by the blood or lymph current into a locality foreign to its nature, though it may remain alive for a while, will certainly not proliferate to any extent, and finally will be infallibly destroyed. Not so with cancerous epithelium. We must accept it as a fact to-day that metastatic cancers originate from particles of the primary tumor bodily transported to distant localities where they proliferate and *reproduce the structure of the primary growth* entirely independent of the histological character of the encompassing tissues. It seems difficult to

* I desire to mention incidentally here that it seems probable that the old theory of Thiersch and Boll, according to which the stroma plays a merely passive part in the histogenesis of carcinoma, and the proliferation of epithelium is due, in a great measure, to the disturbance of the vital equilibrium supposed to exist between epithelium and connective tissue, in favor of the former, will need reconsideration. There are good reasons for believing that very active and quite characteristic processes that have their origin in the stroma can be shown to play an important part in the pathology of cancer.

grasp how the chronic irritation or the toxic influence of a parasite can produce, for instance, a rectal cancer. We see here tubule after tubule with cylindrical epithelium cells, basement membrane, typical arrangement of the stroma, and all, though in a state of wild proliferation, still simulating the normal structure. But how can parasitic action explain the fact that a few particles of this rectal tumor, when transported into the lung or the liver, will produce, not a formless jumble of epithelial cells, but the exact fac-simile of the primary tumor—tubules, stroma, and all the other characteristics? We must agree with Councilman [16] that we have here, according to our present lights, an insurmountable barrier to the theory of a parasitic origin of cancer.

Another problem, as it seems to me, entirely inexplicable by the parasitic theory is presented by certain observations comparatively rare, but sufficiently well attested and studied. I refer to those cases of congenital carcinoma in which both parents are free from tumor and remain healthy.

But leaving theoretical considerations aside, do the actually ascertained facts warrant us in assuming a parasitic origin of cancer? According to the principles long ago laid down by Koch, the following would be necessary in order to establish an indubitable etiological connection between parasites and carcinoma: We would have to find a specific and well-marked micro-organism constantly occurring in every case of carcinoma and in such distribution and topographical arrangement as would suffice to explain the anatomical facts. Pure cultures of this micro-organism would have to be obtained outside of the body; and lastly, methods would have to be found by which inoculations with these pure cultures would reproduce typical cancer.

All attempts at obtaining cultures of protozoa from cancer have thus far entirely failed. The innumerable experiments with a view to a reproduction of cancer by inoculation and transplantation have led to no results. The successful transplantations of Hanau, Wehr, Hahn, and Von Bergmann, though most important, cannot be utilized in this connection.

There remains, then, only the question of the occurrence of specific organisms and their characteristic distribution. I have endeavored to show above that no such specific protozoa have as yet been demonstrated, and that, while it is probable that several kinds of protozoa do occur, they are by no means to be found in every cancer nor in any characteristic distribution. In fact the very earliest metastatic invasion of lymphatic glands, where only very few epithelial cells are as yet distributed through the lymphatic tissue, and where, if at all, one would expect a most unmistakable and vigorous crop of parasites, I have invariably found free from anything resembling protozoa. Ruffer, indeed, finds his cancer-bodies not only of constant occurrence in every form of

cancer, but also in characteristic distribution, and lays particular stress on their constant presence at points of most rapid growth. According to our standard laid down above, however, the protozoan nature of these cancer-bodies has by no means as yet been established, and the objections of Vitalis Müller[47] and others are not disproved. Further investigations will have to clear up these doubts, particularly as some recent very interesting experiments of Power[57] seem, after all, to point toward a possibly specific character of these bodies.

It is well to note *en passant* that in sarcoma, so totally different from cancer in structure, cell-enclosures hailed as possible parasites have also been described. (Steinhaus,[73] Pawlowsky.[50])

Recognizing in a measure the insufficiency of the cell-enclosures heretofore described as a basis for a parasitic origin of cancer, two works have recently appeared in which a different view of parasitism is taken.

Adamkiewicz[1] boldly asserts that the cancer cells are not epithelial in character, nor derivatives of epithelial cells, but themselves the full-grown parasites, and the small-cell infiltration so well known in the histology of cancer, their youthful stage (zoöspores). These parasites produce a toxin closely related to neurin, which, when properly administered, has a decided curative effect upon cancerous disease. It is needless to criticise this book here. Schimmelbusch, Hansemann, Paltauf, have said all that need be said on the subject. I will only mention that the crucial experiment on which Adamkiewicz bases his entire theory, the effects, histological and pathological, of implantation of small pieces of cancerous tissue into a rabbit's brain, has been carefully repeated by Geissler, who has conclusively shown that Adamkiewicz's results are based upon errors due to incomplete asepsis.

The other work is by L. Pfeiffer,[54] to whom we are indebted for so much of our knowledge concerning pathogenic protozoa. After a careful survey of protozoic parasitism in the lower animals and various forms of human disease, he treats of cancer as of undoubted parasitic origin, classifying the protozoön in question as *amœbosporidia*. He studies cancer principally in metastatic nodules in muscular tissue, and accepting the cell-enclosures described by Wickham* and others as representing certain forms in the development of his parasite (*dauerform*), he seeks to establish a complete and characteristic developmental cycle.

While paying tribute to the erudition and indefatigable labor and

* Power's experiments on the effect of chronic irritation on the epithelium of the rabbit have again proved that much of what numerous investigators, and especially Wickham, have described as protozoa (*psorosperms*) is nothing more than cell degeneration. Of Paget's disease I have no personal experience, but through the kindness of Dr. Lustgarten I have had the good fortune to examine fresh material from a case of Darier's disease (*psorospermose folliculaire végétante*). I can only verify the statements of Boeck and of Petersen that there is no proof of the existence of the protozoön, and the so-called psorosperms are in all probability degenerated cell-enclosures and cell-invaginations.

enthusiasm of the author, it must nevertheless be confessed that his arguments are far from convincing. He, too, assents that at certain stages of their development the parasities cannot be distinguished from the ordinary epithelial cells. At another stage they resemble leucocytes so closely that the usual small-cell infiltration of cancer is unhesitatingly identified with the spores of parasites. The cardinal facts in the histology and histogenesis of carcinoma are in a great measure ignored in the speculative enthusiasm of the new theory. The beautiful photographs with which the book is profusely illustrated are entirely inadequate as convincing proofs of the author's opinions.

In concluding this short review we would sum up as follows:

The existence of parasitic protozoa in cancer is probable, though the greater part of what has hitherto been described as parasitic is certainly not so. No constant or in any way specific organism has as yet been demonstrated beyond possibilities of doubt. At present no facts, histological or otherwise, compel the assumption of a parasitic origin of carcinoma, while there are very strong and valid arguments against such assumption.

For many years to come the indefatigable efforts of numerous investigators will be required to throw light on this most obscure of diseases. A more intimate penetration into the mysteries of cell structure and cell life, both in health and in disease; a closer study of the living tumor tissues; an endeavor to clear up the, as yet, entirely obscure chemistry of neoplasms—on these lines, no doubt, advances in our knowledge will be made. Nor should the further study of protozoa be neglected, but it should always be allied with coolest criticism and never leave the *terra firma* of experiment and fact for the airy region of wild theorizing and speculation.

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REVIEWS.

ANATOMY, DESCRIPTIVE AND SURGICAL. By HENRY GRAY, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School. Edited by T. PICKERING PICK, Surgeon to and Lecturer on Surgery at St. George's Hospital, etc. A new American from the thirteenth English edition. Pp. 1129, with 636 illustrations, many of which are colored. Philadelphia: Lea Brothers & Co., 1893.

GRAY'S ANATOMY is too well known to require any introduction. It has been for years the standard text-book on anatomy in most if not all of the medical colleges of this country, as evidenced by the fact that it would be difficult to find any practitioner's library which does not contain at least one copy of *Gray*. Every few years a new edition of this work appears, and now we have the very latest of all—"a new American from the thirteenth English edition."

To criticise this book in any way as regards its make-up would be superfluous. The edition bound in leather with colored illustrations is exceedingly handsome, and as a single volume on general and descriptive anatomy is ahead of all competitors in the strength of its binding, quality of paper, and clearness of type and illustrations. But, of course, however important these things may be, they are but accessories to the subject-matter, of which there is such a large amount that its proper consideration is best obtained, not by taking it up as a whole, but by separate comments on each of the main sections as marked out in the book itself. Before such comment is made, however, it will be well to state that no exhaustive criticism is intended or required. The reputation of *Gray's Anatomy* is already established, and the general excellence of its diction as well as its general accuracy of statement are unquestioned, as they have been for years and will doubtless continue to remain.

GENERAL ANATOMY.—This section is essentially the same as in the preceding American edition. Some desirable additions, however, have been made, viz., two illustrations (Figs. 86 and 99) and an excellent description of the process of karyokinesis in the animal cell, accompanied by an illustration (Fig. 6). But there should be noted under development, failure to mention the probable hypoblastic origin of the cells lining the cavities of the heart (His).

OSTEOLOGY.—This has always been one of the best portions of the book and still maintains its high standard in the present edition. The only unfavorable criticism to be made is that in speaking of the lower end of the humerus, the old term *condyle* is retained to designate what is now almost universally called *epicondyle*.

THE ARTICULATIONS.—In the main there is but little departure from former editions. The principal change is the addition of surgical

anatomy to each joint, as well as a description of its surface form. These additions are of decided advantage, as are also those made in describing the shoulder-joint, viz.: the recognition of the transverse humeral ligament and of the supplemental bands of the capsular ligament, notably that of Schlemm.

The tarsal articulations also have received a new and much clearer description.

Muscles and Fasciæ.—The general arrangement is but little altered. Special commendation must be given to the new illustrations taken from preparations in the Museum of the Royal College of Surgeons, London. With one exception they are all excellent, and add greatly to the value of the text. The exception is Fig. 270, showing the tensor tarsi, which is very obscure, giving no clear idea of the actual arrangement.

The muscles of the perineum have been placed, and very properly so, under *muscles of the trunk*. The intrinsic muscles of the tongue have received an enlarged and greatly improved description. Under *the diaphragm* the external and internal arcuate ligaments are correctly described; his has not been the case in former editions. The same may be said of the supinator brevis muscle. The extensores primi and secundi internodii pollicis have received respectively their less cumbersome modern names—*extensor brevis* and *extensor longus pollicis*. The above comprise all the changes of note, except in the hand and foot, where certain muscles have also received their modern nomenclature, viz.: the deep portion of the flexor brevis pollicis is called *adductor obliquus pollicis*, the adductor pollicis thereby becoming the *adductor transversus pollicis;* while in the foot the same names have been given respectively to what were formerly the adductor pollicis and transversus pedis, with the substitution of "hallucis" for "pollicis." Hallucis, by the way, should be hallicis, genitive of hallex or allex. This is an error not confined to Gray, but common to most of the anatomies.

Arteries, Veins, and Lymphatics.—Few changes have been made, but they are of importance in the line of improvement and in accord with the modern views. Thus the old description of the arch of the aorta is done away with, and we have the *ascending* aorta, the *transverse* aorta, and the *descending* aorta. The limits of the first two correspond to those of the "ascending and transverse portions," respectively, of the "arch of the aorta," while the last, commencing at the upper limit of the "descending portion" of the arch, continues on down, and is divided into the *thoracic* and *abdominal* aorta. Other changes are: The "temporal" artery is called the *superficial* temporal; the cerebral arteries have received a new and clearer description; the relations of the superficial palmar arch are brought out more prominently; likewise the distinction between the common and superficial femoral; the errors in describing the peroneal artery have been corrected.

Under *veins*, the basilic vein should have been described as being continuous with the axillary vein at the lower border of the tendon of the latissimus dorsi and teres major muscles.

The Nervous System.—Under this section the brain and spinal cord have never been particularly well described; it is, therefore, all the more satisfactory to note that a great deal of the matter devoted to these subjects has been practically rewritten and thereby greatly improved. The new description of the medulla is especially to be commended, as is

also that of the floor of the *body* of the lateral ventricles. The floor of the fourth ventricle, however, still retains its old and inaccurate description.

The nerves have always, on the whole, been well described. A few advantageous changes, however, have been made, which give a more accurate description of the superficial petrosal nerve as well as of the lumbar plexus and inferior gluteal nerve. A number of new and good illustrations are introduced.

THE ORGANS OF SENSE.—The tongue, nose, eye, and ear have each the same description as formerly given. A few new and good illustrations have been inserted. No alterations in the text of the first three were necessary. That of the ear, however, should have received a change in the following particular: The "internal ear" should have been distinctly stated to be made up of the bony and membranous labyrinths, and the scala media and organ of Corti should have been described as parts of the latter division.

THE ORGANS OF DIGESTION.—The description of each individual part and organ contained in this section is accurate and clear in all respects with the exception of that of the liver and peritoneum, which ought, in a book of this importance, to be free from the errors presently to be pointed out, especially as great improvement has been made over former editions, both generally and particularly in regard to the pancreas and spleen. The errors referred to are:

As to the peritoneum: The lesser omentum is mentioned as attached above only to the transverse fissure of the liver. This is really but a portion of its superior attachment, the remainder, of course, being along the fissure of the ductus venosus. The lateral ligaments of the liver are stated to consist of two layers of peritoneum, the upper from the greater sac, the lower from the lesser. This is totally wrong, since both layers of each lateral ligament are derived from the greater sac alone.

As to the *liver:* An attempt has been made to correct former editions by the insertion of a new figure (Fig. 548), and by speaking of a "posterior surface." The figure is all right, but should be labelled "*posterior and* under surface of the liver," while the "posterior surface" in the text is limited only to the portion of liver "uncovered by peritoneum," the vena cava and lobus Spigelii being placed, as of old, on the "under" surface. This mistake should not have been allowed to remain, as it is now well known that these two structures are perpendicular rather than horizontal, and are on the posterior surface. In connection with this Figs. 546 and 547 should have been omitted. In other respects the description of the liver is good. Finally, it is to be hoped that Fig. 532, on page 932, will never again be seen in any future edition of *Gray.* As showing the relations of the duodenum and other viscera it is simply grotesque.

As to the remaining sections, *i. e., thorax; voice and respiration; urinary organs; male and female generative organs; hernia,* and *the perineum,* no comment is required except that the descriptions in former editions were deemed sufficiently good, and properly so, to be incorporated, with but slight changes, into the present edition. A great improvement is to be noted in the character of the illustrations of the bladder and female generative organs. The supra-renal capsules are newly and correctly described.

Finally, most favorable attention must be called to the additional paragraphs on surgical anatomy which have been inserted throughout the book, as well as to the paragraphs on surface form. These last occur

in each section, an arrangement much superior to that in former editions, in which all "surface forms" and "surface markings" are collected together under "landmarks" at the end of the book, thereby being rarely if ever noticed by the student. B. B. G.

A DICTIONARY OF MEDICAL SCIENCE. Containing a Full Explanation of the Various Subjects and Terms of Anatomy, Physiology, Medical Chemistry, Pharmacy, Pharmacology, Therapeutics, Medicine, Hygiene, Dietetics, Pathology, Surgery, Ophthalmology, Otology, Laryngology, Dermatology, Gynecology, Obstetrics, Pediatrics, Medical Jurisprudence, and Dentistry, etc. By ROBLEY DUNGLISON, M.D., LL.D., Late Professor of Institutes of Medicine in the Jefferson Medical College of Philadelphia. Edited by RICHARD J. DUNGLISON, A.M., M.D. New (twenty-first) edition, thoroughly revised and greatly enlarged and improved, with the Pronunciation, Accentuation, and Derivation of the Terms. Octavo, pp. 1191. Philadelphia: Lea Brothers & Co., 1893.

FOR many years, in this country at least, Dunglison's was the one standard medical dictionary, and, as the present editor remarks with justifiable pride, two generations of students and practitioners have attested their sense of its usefulness. For many years, in fact, it was, one might almost say, the only medical dictionary. It passed through numerous editions, the last one appearing in 1874 and representing a decided advance on any of its predecessors. Since then many dictionaries have arisen, varying all the way from the tiny vest-pocket lexicon to the mammoth volumes of the Sydenham Society and of Foster. There have been medical encyclopædias, too, such as Quain's, Buck's *Reference Handbook*, and the various systems of medicine and surgery. None of these, however, quite took the place of Dunglison. Obsolete as the former edition had grown in many respects, through the enormous advances made in medicine since its appearance, the book still held its ground and retained its favor among students and physicians too. Nor was the reason for this far to seek. Other books were certainly more up to date, others were fuller and more encyclopædic, but none possessed to the same extent the combined merits of compactness and fulness that belonged to the time-tried Dunglison. While not too bulky, it was yet large enough to leave very few topics untouched upon; it was an eminently well-balanced book, and, in the larger articles particularly, its fulness of detail and the character of its matter, in which description largely replaced dry definitions, made it a valuable and also a very readable work.

The new Dunglison is new indeed—so changed, in fact, as to be really a new book rather than a revision of the old. Its bulk has been greatly augmented, for, though only some seventy pages longer than the former edition, the size of its page has been greatly increased. The editor informs us that 44,000 new words and phrases have been introduced; and anyone who looks through the book in search of changes will be quite prepared to credit the statement. The vast amount of new matter and the thoroughness with which the work has been brought down to date cannot fail to strike even the least observant reader. The immense

advances made in all branches of medical science here find representation; and one cannot wonder enough at the enormous industry implied in amassing and still more in sifting and co-ordinating such a wealth of material.

As in the old Dunglison, so in the new, the treatment of the longer articles, such as those defining the different diseases and those describing the various organs of the body, are the most satisfactory of all. The descriptive character of the older editions has been retained, and the amount of really valuable information conveyed is very great.

To make room for these additions a great deal of obsolete matter has been excised. We could wish that this pruning had been carried out a little more unsparingly, and that Dr. Dunglison had altered a little more in places the old-fashioned diction which gives the book now and then a somewhat antiquated flavor. But it seems hard to cavil at a superabundance when the old matter left in has not been allowed to crowd the new material out; and doubtless there are as many who would complain as loudly if the obsolete and obsolescent phrases which have been handed down as a legacy from dictionary to dictionary since the three great folios of James first saw the light of day were omitted.

A prominent and very useful feature of the old book is retained and amplified in this—we mean the tables which recur with great frequency and represent a vast amount of condensed information. To mention a few selected at random from among the many, we may enumerate the tables of Reflexes (on page 954), of Specific Gravity (on page 1021), of Plastic Operations (on page 876), of Dimensions of the Thorax (on page 1082), and of Wines (on page 1172); and we might add a great many others, old and new, which are eminently valuable and instructive.

The shorter definitions are in the main excellent, although they suffer somewhat from the extreme condensation of expression which was necessitated by the many additions. It would, too, have been an advantage if the different meanings of the same word, which are now grouped together in the same paragraph, had been placed in separate paragraphs, or had been separated in some other way, so as to show that they are distinct from one another.

The old Dunglison gave the accentuation of its terms; the new one gives their pronunciation also. The system adopted is extremely simple, and in many and probably the majority of cases, indicates very well the way in which the words should be sounded. We are inclined to think, however, that in the attempt to secure simplicity and avoid pedantic subtleties, the author has fallen into the opposite error and has sometimes failed to attain the necessary precision. Thus Polycarpæ is written pol-e-kar′pe, where the average reader would probably not grasp at once the phonetic value of the e in the second and fourth syllables, in which it represents the first e of scene. So ku-ran′tur, which is given as the phonetic equivalent of Curantur, may to the uninitiated mean either kew-ran′tur or koo-ran′tur. Moreover, in indicating the pronunciation of Latin the author is hardly consistent. For while he writes Silene as pronounced sil-a′na (*i. e.*, sĭl-ā′nā), and Sceloncus he pronounces skel-on′kus, so that one would think that he is employing the Roman method altogether, he also writes re′je-ah ak′wah for Regia Aqua, and pu-ta′men for Putamen, which pronunciations are strictly in accordance with the English method, and he indicates Regina Prati by rej-e′nah prah′te, which is a mixture of the English and Roman methods.

In a book which has, like this, been so made over as virtually to constitute a first edition, typographical errors are unavoidable. Indeed, when we consider under what a tremendous high-pressure the author must have worked to accomplish what he has done, we can only wonder that errors are not much more frequent. Among those that we have noticed are Stenorœic for Stenopœic, Thermotoxic for Thermotaxic, Pate'ra for Pat'era. Occasionally, too, the descriptions seem inadequate or faulty—*e. g.*, in the account of Scheiner's experiment. But, on the whole, these blemishes are few and far between and do not materially invalidate the general accuracy of the work. Indeed, in respect to accuracy and freedom from errors, the book quite equals and usually surpasses any of its contemporaries that we are acquainted with.

In typography and mechanical execution the book is excellent. The heavy type used for the headings and subheadings gives them a prominence suited to their importance, while the body of the work is printed in a text which is minute enough to be in marked contrast with the titles, and at the same time is very clear and legible. Moreover, in spite of the great amount of added matter and the consequent increase in the size, the book is not unhandy; it is bigger than before, but not too big—is still portable, and can be consulted without inconvenience or fatigue.

To sum up, we may say that the new Dunglison has most, if not all, of the good features which characterized the old; that in addition it has been brought down to date, so as to represent adequately the latest advances in medical science; and that it contains a vast amount of well-digested and well-arranged information presented in a manner very suitable for reference. A. D.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

The Treatment of Tuberculous Pleurisy.

Dr. William Osler states that the indications are twofold: First, to limit and control the exudate and to promote its absorption. In the early stage it is sufficient to allay the pain, if severe, with opium; to reduce the fever, if high, by sponging, and to keep the bowels freely opened. It is doubtful whether the salicylates deserve the confidence which many claim. While fluid remains in the chest it is for the good reason that it cannot get out, owing to blocking of the lymph paths. Absorption from the pleura goes on, chiefly if not entirely, from the costal layer. Good results are seen from putting the patient on a dry diet, and giving brisk saline cathartics. Diuretin, when it acts, is useful in the same way. If at the end of ten days the exudate persists, and is at the level of the fourth rib in the erect posture, aspiration is advisable, and this may be repeated in a few days if the fluid reaccumulates. There are no greater risks in the tuberculous than in the simple sero-fibrinous cases, and it is very important to relieve the lung early of the compression to which it is subjected by any large quantity of fluid. The risk of the compressed lung becoming the seat of tuberculosis is not very great; more serious is the danger lest it should become bound down by such firm adhesions that it cannot expand. Gentle counter-irritation of the skin is probably beneficial in these later stages, stimulating the lymphatics of the costal pleura. In chronic sero-fibrinous effusion with thickening of the membranes, the fluid reaccumulates rapidly, and aspiration may have to be performed many times, and pulmonary gymnastics should be practised. If the exudate be purulent the case should be transferred to the surgeon for thorough drainage. The second indication is to improve in every way possible the general nutrition of the patient, so as to favor conditions promoting the healing of the tuberculous process. No doubt, as in pulmonary and peritoneal

infection, many instances of tuberculosis of the pleura recover, and leave no more damage than that associated with slight thickening of the membrane. A life in the open air, regular habits and exercise, a nutritious diet, and the use of the remedies which promote in every way digestion and the assimilation of food, should be advised.—*Transactions of the Massachusetts Medical Society*, 1893.

The Physiological Action of Quinoline, Isoquinoline, and some of their Derivatives.

Dr. Ralph Stockman, stating the fact that quinoline, isoquinoline, and certain of their derivatives have a number of isomeric alkaloids of nearly similar constitution, but having certain of their atoms or radicals differently placed in relation to each other, believed that it would be of interest to ascertain whether those slight differences in chemical constitution exert any appreciable influence on the physiological action of the bodies in question, more especially as a number of complex alkaloids (such as quinine, cinchonine, strychnine, morphine) are thought to be derived from quinoline, while recently it has been proved that others (such as berberine, narcotine, papaverine, and hydrastine) are derived from isoquinoline. Quinoline (C_9H_7N) is a strong antiseptic and antipyretic, and depresses the central nervous system. Isoquinoline is isomeric with it, the only difference being that the atom of nitrogen occupies a different position. Experiments on frogs and rabbits showed no difference, either qualitative or quantitative, in the actions of the two substances (tartrates and methiodides). The physiological action of quinaldine (α methylquinoline), lepidine (γ-methylquinoline), α-γ-dimethylquinoline, orthotoluquinoline, and paratoluquinoline, were also investigated. Tartrate of quinaldine has, in frogs and rabbits, an action similar to that of quinaldine or isoquinoline, but it is somewhat less active. The dimethylquinoline is still less active, and therefore it would appear that the substitution of methyl radicals for hydrogen atoms in quinoline weakens its depressing action on the nervous system. With the other substances observations were made on frogs only, the sulphates, which are fine white crystalline salts, being used. Their actions seemed similar in every respect to that of quinaldine. It is evident, therefore, that in the quinoline molecule the position of the nitrogen atom, or of the methyl radical does not exert any appreciable influence on the physiological action of these substances, and further, that the substitution of CH_3 for H only slightly alters its action, and that only in degree and not in kind. It is improbable also that the derivation of a more complex alkaloid from quinoline or isoquinoline respectively, is in any way a factor which determines its action, seeing that these two substances have exactly similar reactions.—*The Journal of Physiology*, 1893, No. 3, p. 245.

The Influence of Salt-baths upon the Nitrogenous Excretion in Man.

Dr. Rudolf Köstlin, from his very careful observations, has reached the following conclusions: 1. A simple warm bath of an hour's duration is without influence in albuminous metabolism. 2. A 4 per cent. bath of Stassfurter bath-salt diminishes the nitrogenous excretion about fifteen to twenty grains.

3. A 20 per cent. bath of Stassfurter salt acts as does the 4 per cent. 4. Cooking-salt baths, 4 per cent. as well as 20, are without influence on metabolism. 5. Warm mustard baths do not influence the albuminous metabolism. Stassfurter bath-salt contains chloride of soda, 19.5 per cent.; of potash, 24.1 per cent.; of magnesium, 38.7 per cent.; of calcium, 0.6 per cent.; and of sulphate of magnesia, 16.6 per cent.—*Fortschritte der Medicin*, 1893. Bd. xi, S. 727.

Clinical Experience with Senna Cathartic Acid.

Dr. Karl Dehio notes that Kubly has isolated a substance from senna leaves which he believes to be the active principle, and to which he has given the name of cathartic acid. As this substance is irregular and unreliable in its action, it seems fair to conclude that it is not a chemically pure body. Gensz has also isolated an active principle of senna leaves, to which the same name has been given, although it is not identical with that mentioned above. The latter is a brownish-yellow powder with difficulty soluble in cold, but readily in hot water, and of weakly acid reaction. Further investigation will determine if it be identical with the active principle of rhubarb and frangula. In dose of from one to three grains it produces, after five to seven hours, watery movements, sometimes accompanied by somewhat severe cutting abdominal pains, but usually it is of entirely painless action. The results of its use in twenty-one persons are recorded, generally in single dose and in the form of tablets. In general in healthy persons, with frequent and copious evacuations, considerable pain was observed, while in cases of simple constipation it found favor because it did not cause any very severe pain. The slower its action the less pain resulted. As the remedy does not have an unpleasant taste, rubbed up with sugar it will be readily taken by children. The dosage can be made more accurately than with other senna preparations. The more obstinate the constipation the milder appears to be the operation of this remedy, and in these cases this should be the cathartic to be chosen. —*St. Petersburger medicinische Wochenschrift*, 1893, No. 27, S. 255.

Rest in the Treatment of Chlorotic Anæmia.

Dr. Frederick Taylor believes that the very important factor which has been too little regarded, or even ignored altogether, is physical or bodily rest. Arguments which are advanced are: an essential feature of the developed disease is a deficiency of hæmoglobin in the blood. By saving the expenditure of hæmoglobin the patient may utilize what little she has to greater effect, and sooner arrive at a favorable balance than if her income in food, in oxygen, and in iron were alone cared for while the expenditure in muscular exercise and the additional employment of the respiratory and cardiac functions were entirely neglected. If the heart is found to be dilated the argument is all the stronger, since this is a sufficient ground for requiring that physical rest shall be enjoined. It is a familiar fact that these cases improve rapidly when admitted to a hospital, although it cannot be urged that they are very much benefited by the air, food, or exercise which they get there. Iron should be given in the most suitable form, and a perfect action of the bowels should be maintained. Against fresh air nothing can be said so long as it does not involve exercise, either by walking or riding.

In slighter degrees of anæmia, or in one already recovering, carriage exercise may be allowed, while in the severer forms the patient may with advantage be kept in bed entirely—the most certain means of keeping a patient absolutely at rest. An intermediate prescription is that the patient shall get up only for three or four hours in the afternoon.—*The Practitioner*, 1893, No. 303, p. 161.

Duboisin as a Remedy for Attacks of Hystero-epilepsy.

Prof. Peter Albertoni, noting the recent communications concerning the sedative action of this remedy, has made use of it in three cases. The sulphate was used by injection in the dose of one one-hundred-and-sixtieth of a grain, although Samuely, in a case reported in this paper, has made use of the dose of one thirty-second of a grain. He concludes that it is a useful remedy for the purpose above mentioned.—*Therapeutische Monatshefte*, 1893, Heft. 8, S. 409.

Dermatol Dermatitis.

Dr. Matheus has used dermatol in his practice often and successfully not only internally but also externally. Unpleasant complications he has observed in an ulcer of the leg when there was a marked inflammation of the surrounding skin. Usually the case goes on without any dermatitis, but recently he has observed three cases. He uses the remedy as a dusting powder morning and evening, the patient remaining in bed. The dermatitis appeared at the end of the first or the beginning of the second week, the skin which was involved was strongly reddened, felt hot to the touch, and secreted a large amount of watery fluid, and in one case was the cause of considerable disturbance of the general condition.—*Therapeutische Monatshefte*, 1893, Heft 8, S. 402.

Lysol.

Dr. C. B. Adams, from a series of laboratory experiments, is convinced of the powerful germicidal action of lysol, and believes that it is deserving of high rank, because—1. Of its power in weaker solutions as compared with carbolic acid. 2. It is but slightly, if at all poisonous to the system. Gerlach and Sugg showed by actual demonstration that carbolic acid was eight times, and creolin twice as poisonous as lysol. 3. It is the most easily soluble of all disinfectants. 4. It is reasonable in cost. 5. It is of great value as a deodorizer. In wounds its oily properties act as a soap, and thus it more deeply penetrates the tissues.—*Notes on New Remedies*, 1893, No. 3, p. 40.

Dr. E. P. Murdoch believes that in the choice of an antiseptic—1, safety; 2, efficiency; 3, adaptibility and ease of handling; 4, freedom from unpleasant results must be considered. He has used lysol in a number of cases of railroad injuries with perfect satisfaction; this, too, when the severe contusion, so common in these injuries, produced extensive sloughing. He reports two instances of its use. He has found this antiseptic to be safe, pleasant, and efficient. As compared with bichloride, it is its equal in efficiency, and it possesses the advantage of being free from toxic effects. Because of its anæsthetic properties it is a most satisfactory dressing for burns.—*The American Therapist*, 1893, No. 3, p. 72.

MEDICINE.

UNDER THE CHARGE OF

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DISCHARGE OF GALL-STONES WITH SEVERE HÆMATEMESIS.

LYCETT (*Brit. Med. Journ.*, 1893, No. 1706) records the following case: B. P., aged twenty-seven years, after premonitory hepatic symptoms accompanying a distended gall-bladder, vomited about a pint of arterial blood. Subsequent motions contained altered blood and numerous calculi, some as large as horse beans. Hæmatemesis recurred on the fifth and tenth day; with the first hemorrhage was ejected a gall-stone larger than any passed per rectum. Considerable collapse followed the last hemorrhage. At no time was jaundice present, nor did the urine contain bile. Abdominal section was considered in conjunction with Dr. Wade, but not deemed advisable.

FATAL CASE OF PYRIDINE POISONING.

HELME (*Brit. Med. Journ.*, 1893, No. 1711) reports the following case: A muscular man, of twenty-nine, employed as stillman at some tar works, was admitted at 10.30 P.M. He stated in a thick guttural voice that he had swallowed "half a cupful" of pyridine bases at 3 P.M. that day, and had vomited five times during the intervening seven hours. State on admission: Pale, perspiring freely, dry white tongue, slightly cyanosed lips; temperature 103.4°; pulse 128, weak and intermittent; respiration 40; coarse mucous râles in trachea; complained of tightness in breathing, with choking sensation and pain over the stomach. Demulcents were given in very small quantities by the mouth, and three ounces of brandy by enema. Later he could swallow a little better. The white frothy expectoration and the breath smelt of pyridine. Nine hours after the accident the temperature was 104° F., but fell again to 99° within six hours. The bowels acted six times during the night. Partially formed light stools not smelling of pyridine. At 8 o'clock next morning sputa became purulent and lost odor of pyridine. There were signs of acute congestion and bronchitis over the lungs. At 4 P.M. he became wildly delirious, and he died next morning, forty-three hours after the accident. The temperature during the last night varied between 104° and 105.8°. Ten ounces of urine were passed during the last twenty-four hours, and the bowels were relieved six times.

At the post-mortem examination, made twenty-nine hours after death, the epiglottis was found congested on its under surface. The larynx and trachea

were lined by a friable yellow membrane, the large bronchi contained purulent matter, and were lined by a similar membrane. The lungs were congested and œdematous. Nothing was observed about the mouth, tongue, or fauces, but the œsophagus and cardiac end of the stomach were greatly congested, the pyloric end and the commencement of the duodenum being slightly congested. The only changes found throughout the intestines were a few small petechiæ in the small intestine. The liver was of normal size, and showed a few small fatty patches on its upper surface. No changes were detected in the heart, kidneys, or spleen, and no odor of pyridine was observed throughout the examination.

Infantile Eclampsia with Slow Pulse.

Morrison (*Lancet*, 1893, No. 3662) relates the following case: Female child, aged nineteen days. The attack appeared to have been caused by injudicious feeding. When first seen her condition was as follows: Respiration was about 12 per minute, very slow and infrequent, and prolonged into a stertorous snore, such as one observes shortly before death; the heart's beat was about 10, 15, and 20 per minute; the body was cold; the patient was perfectly unconscious, and the pupils were contracted to the size of a small pin's head; both pupils were equally contracted. There was no convulsion beyond an occasional quivering of the lips and rapid convulsive protrusion of the tongue. Ether inhalation and artificial respiration produced very transient effects. From 40 to 60 drops of B. P. tincture of belladonna was then injected into the rectum in a little water, and a few minutes later, as no effect was observed on the pupils or the heart, another half-teaspoonful was given by the mouth and pushed well down the throat. In a few moments, and quite suddenly, the pupils dilated to about three millimetres in diameter, and forthwith the heart bounded away like a steed which had suddenly wrenched itself loose from its fastenings. This acceleration continued for a longer time and was much more marked than that which followed any previous excitant; but it, too, at length began to yield to the comatose lethargy which appeared to be invincible. Then again was given a similar quantity of tincture of belladonna and ether by the mouth, which was followed by a further dilatation of the pupils and increased cardiac acceleration. In all, the child had ninety minims of tincture of belladonna (B.P.) and from twenty to thirty minims of ether in addition to that inhaled. Consciousness did not return until several hours after the recovery of the circulation and respiration. Within twelve hours the pulse rose to 202, and the temperature to 104°. An ice-compress to the head and a little iced water by the mouth were immediately followed by rapid slowing of pulse and fall of temperature, and the condition became once more critical. The child ultimately recovered.

The Disinfection of Houses Infected with the Bacillus Tuberculosis.

Ransome and Delépine (*Brit. Med. Journ.*, 1893, No. 1714) have made a preliminary report on this subject. Experimental investigations were made to test the value of the methods used by the municipality of Manchester for

disinfecting rooms which had been occupied by certain classes of tuberculous persons. The method pursued was as follows:

"Pieces of wall paper (or, in later experiments, of ordinary paper) were carefully sterilized in glass capsules. They were then infected with tuberculous material, either sputum or pure cultivations of bacillus tuberculosis (human in most cases, avian in a few), then the capsules were sealed, the sputum or cultivation being allowed to dry on the paper. These were then sent to the officer who had to disinfect certain rooms. The capsules were opened just before the acid was poured on the chlorate of potash, and sealed again when the room was reopened. The capsules were sent again to the laboratory, where rabbits and guinea-pigs were inoculated with small pieces of infected paper or superficial scrapings, mixed with sterilized bouillon. In all cases control experiments were made with pieces of paper treated exactly in the same way, but kept in the laboratory until the capsules which had been sent out had been returned.

"Some other precautions were also taken to avoid fallacies which might be caused by the effect of drying or of exposure to light, or of some unknown irritating properties of the wall paper in use. It was also found desirable to use tuberculous matter from various sources."

The author's conclusions, based on thirty-four experiments, are as follows:

"I. Intra-peritoneal injections of scrapings of wall paper sterilized by heat (result negative, as expected).

"II. Intra-peritoneal injection (in rabbits) and subcutaneous inoculation (guinea-pigs) with scrapings or bits of paper infected with tuberculous sputum, and exposed to the action of euchlorine in rooms that were being disinfected. Nine experiments made with three different kinds of sputa; the results show that the effects of the disinfecting process are uncertain; in some cases complete disinfection seems to have been obtained, but the control experiments (III.) show that some sputa are not so virulent as others.

"III. Intra-peritoneal injection (rabbits) or subcutaneous inoculations (in guinea-pigs) with paper infected with tuberculous sputa, the papers not being afterward exposed to the action of euchlorine. Eight experiments, five of which were made with the sputa used in Series II.; one of these sputa acted very slowly, this possibly accounting for the apparently complete disinfection of papers infected with that sputum.

"IV. Inoculations with papers infected with tuberculous sputum, and allowed to dry in the dark for forty-five days. Two experiments; doubtful result in one rabbit, typical tuberculosis produced in a guinea-pig.

"V. Inoculations with papers infected with tuberculous sputum and allowed to dry in the air for forty-five days, being at the same time exposed to daylight. Two experiments; no certain evidence of tuberculosis could be found eighty days after inoculation.

"VI. Inoculations with paper infected with pure cultivations of bacilli obtained from a case of human tuberculosis not disinfected afterward. Four experiments; in all cases marked evidences of tuberculosis were found within three weeks from date of inoculation.

"VII. Inoculations with papers infected with pure cultivations of bacilli of avian tuberculosis, and not disinfected afterward. Three experiments; distinct signs of infection were obtained within three weeks from the date of

inoculation, but, of these animals, two being allowed to live, one recovered, and slight traces only of tuberculosis were found in the other thirty-five days after inoculation.

"VIII. Inoculations with papers infected with pure cultivations of bacilli of human tuberculosis (see VI.), and afterward exposed to the action of euchlorine in rooms that were being disinfected. Six experiments; in all cases distinct evidences of tuberculosis were observed within three or four weeks from the time of inoculation."

SURGERY.

UNDER THE CHARGE OF

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A Case of Intra-cranial Injury.

Considerable knowledge has been gained concerning the functions of the brain, and especially of the position of the centre of so-called muscular sense, by the case reported by Laylock (*Australian Med. Journ.*, July, 1893), occurring in the service of Cooke. The patient, twenty-nine years of age, received a blow upon the head from the falling limb of a tree. On admission to the hospital there was unconsciousness with great restlessness and delirium. The vertex was extensively fractured, and in the wound were pieces of bone and brain substance. The gap in the cranium measured three by four inches. An exploration with the finger showed a linear fracture about one-quarter of an inch wide in the base of the skull just behind the orbits. The right frontal bone could be easily moved, and in fact the skull had been practically split in two in the line of the blow. The author gives the following as points of interest: "From the nature of the injury, a zone of brain substance just in front of the fissure of Rolando would bear the brunt of the blow, and its left half would, at least, be severely concussed. This left half would include Broca's convolution (the centre of speech), and the anterior end of the temporal lobe (one of the auditory centres)." The symptoms shown at first showed that the auditory and speech centres were in a state of extreme excitability, and that a spoken word set in automatic motion all these centres and produced speech. There were also movements of the right arm that showed its cortical centre to have been in a state of irritation at first. The late symptoms of cramp and burning pain in the right arm, with weakness, are rather ominous, and lead to the suspicion of deep mischief on the left or

opposite side. The part of the brain destroyed on the right side is, with the exception of the base of the falciform lobe, the area regarded as the motor. "Nevertheless, the sensory and motor functions of, say, the arm, as it is the part most involved, seem to be affected in a relatively equal degree, and both of these functions seem to have been cut down to a very rudimentary level."

"On the sensory, or, to be more exact, the afferent side, there is simple tactile sensibility, but there is absence or deficiency of the higher conceptions of sensation, which are evolved from the lower and simpler levels, such as the position of the limb, the qualities and positions of foreign bodies touching the part, their weight, resistance, etc." Simple movements can be made, but the power of making more complicated co-ordinated movements is wanting. "As both of these afferent and efferent functional disturbances are the result of one and the same injury, it follows that the part destroyed, that is, part of the Rolandic area—is sensory-motor."

From the experience gained by this case, this author would be led to fill up the anterior half of the anterior limb of the internal capsule, and call these the tracts of the so-called muscular sense, or, as he prefers to call it, the sense of local relation.

The patient recovered to a great extent, but not entirely.

Trephining for Focal Epilepsy.

An interesting case of trephining for traumatic focal epilepsy, with electrical stimulation and excision of the focus, is reported by Parker (*Brit. Med. Journ.*, May 27, 1893). The patient was a boy, aged nine years; there was a history of a fall on the right side of the head, followed by vomiting. The family and personal histories were good. The first signs noticed were tremors in the left hand that gradually increased in frequency and severity. There were, in addition to the movements of the hand, arm, and shoulder, twitchings of the head and turning of the eyes toward the right side, and later the patient used to fall; the fits were always of short duration, and the patient never injured himself or bit his tongue. There was no cry, and auræ were slight and scarcely noticed. It was decided to trephine over the genu of the fissure of Rolando to expose the centre for the thumb and wrist. A button one and a half inches in diameter was removed and the centre found to lie directly below it. No antiseptic was used after the opening of the dura mater, boiled water being used instead in order that stimulation by the faradic current might not be interfered with. This stimulation produced contractures of the thumb and wrist, and the portion stimulated was removed by a sharp spoon after incising the pia mater. After the operation and the patient's recovery from it, he improved slightly, but time alone can give the verdict.

An Important Complication in Caries of the Spinal Column.

The fact that irregularities of the spine in a lateral direction sometimes accompany caries of the vertebræ has long been known, but Noble Smith (*Prov. Med. Journ.*, September, 1893) thinks it has generally been attributed to a predominance of the disease upon one or other side leading to bony deformity. It is a most serious matter that the importance of this combination

of lateral curvature with caries should be recognized, and he feels that it has not received adequate attention. He is opposed to the treatment of all forms of lateral curvature by exercise, although he admits that we often meet with the ordinary appearance of scoliosis. He has met cases in which such exercise has rapidly developed an obscure case of caries, "the lateral deviation having been considered as conclusive evidence that no inflammatory disease was present. That lateral deviation may occur in caries from structural changes has long been recognized, but that lateral curvature of the ordinary scoliotic form should accompany and even precede the majority, or at least a great number of the ordinary cases of caries, has not been generally acknowledged. The latter is a curvature with rotation which accompanies the caries and which extends beyond the area of inflammation and it is essentially the result of weakness and discomfort." He has observed lateral deviation to accompany caries in the following varieties: 1. From general weakness. 2. From spasmodic muscular action. 3. Independently. 4. From lateral loss of substance. He reports a series of such cases.

Surgery of the Ankle-joint.

An ingenious and interesting operation is reported by Tenier and Hennequin (*Rev. de Chir.*, August, 1893), in which they reproduced the functions of the ankle-joint after the loss of the inferior extremity of the fibula and the absence of the internal malleolus. They conclude that this operation demonstrates the possibility: 1. Of making exclusively from the end of the tibia a joint which allows little to remain wanting in function, and nothing in solidity or regularity. 2. Of preserving entirely the position, the direction, and the function of tendons displaced during the operation, accomplishing this by not opening their sheaths, but removing with them the adjacent periosteum to which they are adherent. 3. Of creating a re-arthrosis, so to speak, in its entirety, reproducing with fidelity the normal articulation, and to a certain extent all its movements, except that the tibial surface was made in spongy bone tissue, and in consequence was devoid of cartilage, and the astragalus had lost part of its cartilaginous surface through fibrous degeneration. The patient recovered completely the use of the foot, and could walk with ease, though flexion and extension were slightly limited.

The Causation of Hemorrhoids.

In contrast to the work done by Thompson is the theory of Quésnu (*Rev. de Chir.*, March, 1893), who says: Hemorrhoids are made up of varicose changes, not in one or two veins, but from a number of smaller branches and capillaries in the mucous membrane, the submucosa, and also in the muscularis; their changes are due to injuries to the walls, to an inflammation of the inner wall, which reaches by contiguity the surrounding structures. The arteries do not participate in this. Not until the vessels, either from an inflow of alcohol, gout or rheumatism, etc., or through the direct influence of micro-organisms from the intestine, are attacked, and the inflammation by these means deprives their walls of their elasticity, can an increase of blood-pressure cause their dilatation, lengthening, and varicose condition even to bleeding.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Rhinoliths.

Cozzolini has reported (Morgagni, March, 1893, cited in *Annales des Mal. de l' Oreille, etc.*, 1893, t. xix. No. 8) a case of rhinolith which had produced partial destruction of the nasal septum so that it occupied both nasal fossæ. This is said to be the only case of that description on record beside one found on the cadaver by Zuckerkandl (*Norm. und path. Anatomie der Nasenhöhle, etc.*, 1892, Bd. ii. p. 158).

Cozzolini has also reported (*Revista Clinica e Terapeutica*, June, 1893, *idem*) a case of two rhinoliths occupying the same nasal fossa. Cozzolini operates by insinuating bent probes behind the body so as to drag it forward—a procedure he considers preferable to the use of forceps, which usually push the rhinolith more deeply into the nasal passage before it can be securely grasped.

Cozzolini makes a distinction between true rhinoliths in which the calcareous deposit becomes formed around a nucleus of mucus or of blood, and false rhinoliths, the more common, in which a foreign body such as a cherry-stone, a bead, or the like, has formed the nucleus. The former, he states, are rarely found before the fortieth year of age; the latter may be found at any age, the foreign body often having been inserted in play during childhood.

Vascular Polypi of the Nasal Septum.

Dr. Schadewald has reported three cases, the growth from one of which he showed at the Laryngological Society of Berlin (*Annales des Mal. de l' Oreille, etc.*, 1893, t. xix. No. 8). It was the bulk of a lentil and tolerably firm in consistence. Compression with the finger serves to restrain the hemorrhage after extirpation. He has never seen them in males, but Flatau has had two cases in men. Heymann, on microscopic examination, has recognized an angioma with large spaces, separated only by narrow barriers of granulation tissue.

Abscess of the Frontal Sinus.

Dr. L. Lichtwitz, of Bordeaux, reports (*Annales des Mal. de l' Oreille, etc.*, 1893, t. xix. No. 8) a case of latent empyema of the left frontal sinus thoroughly cured by topical injections of antiseptic solutions after a year's treatment. He states that this case and one of two similarly treated by Schutter are the only cases on record cured by injections into the sinus by the natural orifice without external intervention. He states that the pus withdrawn from the sinus with all antiseptic precautions contained the pneu-

mococcus of Talamon-Fraenkel in very great abundance, and that its virulence was established by inoculations into mice—a fact which he claims explains the possibility of infection of the meninges from disease of the frontal sinus.

Sarcoma of the Nasal Septum.

Dr. A. d'Aguanno, of Palermo, reports (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 9) a case of sarcoma of the nasal septum in a girl eleven years of age. A month before he saw the case a minute tumor was detected upon the right side of the septum, near the orifice. Within the month it had grown to the size of a large haricot bean. It was implanted transversely on its posterior half only; its surface was rugous, and it bled upon being touched with a probe. The free portion was excised with the cold snare, and the electric cautery was employed to destroy the sessile portion. Some subsequent cauterizations were necessary. At the end of two months there had been no recurrence. On microscopic examination by the professor of pathologic anatomy at Palermo, Dr. Sirena, the growth was found to be a polymorphous sarcoma, lympho- and fuso-cellular.

Primary Diphtheritic Croup and Abscess of the Larynx.

The rarity with which tracheotomy in the adult prevents death from diphtheria is exemplified in an interesting case recently reported by M. Koch to the Belgian Society of Laryngologists (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 10). A woman was afflicted with intense dyspnœa. The pharynx was healthy, but an abscess discharging pus was seen underneath the vocal bands. The following day in a violent paroxysm the patient ejected a large membrane measuring some seven centimetres in length. Tracheotomy was necessary and permitted the evacuation of some more pus. There was temporary amelioration, but evidences of infection were present the next day, and the patient died in the evening. Microscopic preparations from the false membrane were filled with micrococci and the bacilli of Löffler.

Prolapse of the Ventricle of the Larynx.

In a case of prolapse of the ventricle of the larynx recently exhibited at the Laryngological Society of Berlin, Prof. B. Fraenkel demonstrated (*Annales des Mal. de l'Oreille, etc.*, 1893, t. xix. No. 8) that the prolapse consisted of the lateral wall of the ventricle. The superior portion of the vocal band which touched the prolapse seemed to be modified in its structure. The muscular fibres of the thyro-arytenoid seemed to be atrophied. The connective tissue and the epithelium seemed to be hypertrophied, so that the image recalled that of pachydermia.

Lipoma of the Tongue.

Dr. Julius Rosenstirn, of San Francisco, reports (*Medical Record*, 1893, vol. xl., No. 13) and illustrates a case of lipoma on the base of the tongue in a tuberculous subject, with lipomata in other portions of the body. The article contains a summary of the literature on the subject.

DERMATOLOGY.

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The Relation of Certain Skin Diseases to Disturbances in the Digestive Tract.

A. Pick, in discussing this subject (*Wiener medizinische Presse*, 1893, No. 31), thinks it probable that, in the digestive tract of those individuals in whom the ingestion of certain articles of food gives rise to urticaria, ferments or micro-organisms occur which form poisons out of substances contained in these foods; and points out the fact that urticaria and erythemata frequently occur in such persons as suffer from a slowing of the movements of the alimentary canal, in consequence of which abnormal fermentation and putrefaction of the ingesta occur. The author relates a case in which he was able to prevent the appearance of an urticaria, which always followed the use of potatoes and preserved fruit, by the administration of 5-ctgm. doses of creosote. After taking this drug for a week it was suspended experimentally, when the eruption again appeared upon the use of the above-mentioned food. With the resumption of the creosote the urticaria again disappeared.

Gallanol in Psoriasis and Eczema.

Under the name *gallanol*, MM. Cazenave and Rollet (*Journal des Maladies Cutanées et Syphilitiques*, July, 1893) have employed in psoriasis and eczema the anilide of gallic acid, which in the impure state is known as gallol. This substance is non-toxic and non-irritating, and possesses reducing and antiseptic properties. In a patient affected with a psoriasis of eleven years' duration a cure was obtained in a short time by painting the lesions with a mixture of chloroform or alcohol and gallanol, and afterward covering them with traumaticin. In another case, which had been treated without appreciable result by chrysarobin and pyrogallol, great improvement followed these applications. In eczema the action of gallanol is rapid in the oozing forms, relieving the itching quickly. The authors have applied the remedy in powder, in ointment, and by painting it upon the diseased skin. The powder, white, impalpable, and slightly adhesive like aristol, does not cause burning, and quickly relieves the itching of chronic eczema. The ointment, made up with vaselin, has been used in 3–25 per cent. strength. Gallanol causes neither redness, inflammation, nor pigmentation of the skin, does not soil the linen, is odorless, and for these reasons is to be preferred to chrysarobin and pyrogallol.

Metastasis or Shifting Elimination as a Factor in Certain Skin Inflammations.

Walsh (*British Med. Journ.*, August 26, 1893) advances the theory that certain forms of dermatitis connected with abnormal conditions of the blood may be directly due to the elimination of irritating substances. Uric acid and the scarlatinal virus may be regarded as types of unusual substances circulating in the blood which are capable of causing inflammation of one or more of the channels of elimination. Uric acid in excess being highly damaging to the epithelium of excretory organs is able to produce, besides dyspepsia, nephritis, bronchitis, some forms of dermatitis. Metastasis is often a marked feature in gout, a typical eczema sometimes occurring during an acute gouty attack, and disappearing under treatment with colchicum. The skin trouble may alternate with bronchitis and asthma, or with diarrhœa. The scarlatinal poison, like uric acid, acts as an irritant upon the epithelium of excretory organs, and may cause dermatitis in addition to nephritis and inflammations of the respiratory and alimentary tracts. Dr. Walsh holds that if uric acid be excreted by the bowel, diarrhœa results; by the skin, dermatitis; by the kidney, nephritis; by the lung, bronchitis—these various inflammations being the result of excretory inflammation.

Infectious Lentigo of the Aged.

At a meeting of the Société de Médecine et de Chirurgie de Bordeaux (*Journal des Maladies Cutanées et Syphilitiques*, June, 1893) M. Dubrenilk presented a patient who for twenty-five or thirty years had had a red spot upon the left cheek consecutive to an injury. This patch during the past six years began to be pigmented. A year later in the neighborhood of this pigmented patch a small epithelioma developed, which was removed. Four years later a new epithelioma appeared, not in the cicatrix, but near it.

The author is inclined to regard the affection as allied to *xeroderma pigmentosum*, since, in addition to the pigmentation, vascular patches are present.

A Case of Dermatitis Herpetiformis.

At the session of January 6, 1893, of the Dermatologische Vereinigung zu Berlin (*Monatshefte f. prakt. Dermatologie*, Bd. xvii. No. 5) Peter presented a case of dermatitis herpetiformis in which the herpetic character was clearly marked.

The patient was a woman, thirty-eight years old, who in her twentieth year first suffered from an erythematous, or rather a wheal-like, strongly itching eruption upon the thigh, which was followed by vesicles arranged in rings or circles. The vesicles dried up or were scratched, leaving pigmented scars which were clearly marked off from the surrounding skin by a dark border. Alteration of the general condition, depression, even attacks of fever, preceded the outbreak of the eruption. For almost ten years the disease remained limited to the lower extremities, the attacks being repeated at not very great intervals. In the last eight years the process has involved the upper arm and the shoulder, presenting here the same appearance as on the lower extremities, with the exception that the vesicles are crowded into a smaller space.

OPHTHALMOLOGY.

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REFLEX AMBLYOPIA DURING PREGNANCY.

MR. A. LAWFORD KNAGGS (*British Medical Journal*) reports a case in a woman, aged forty, who during a previous pregnancy, eight years before, had noticed a dimness toward the left side, but did not discover that her left eye was blind till a month after her confinement. Since then she has had four children without any trouble with her sight. The left eye was quite diverged, and presented a bluish-gray atrophy of the disk, with arteries only half the size of the veins, which were of good calibre. In the right eye vision 5/10. She came for glasses, having hyperopia 3 D. Optic disk regarded as sound. She was then four months pregnant. Six weeks later vision had fallen to 5/35, and the field of vision was considerably smaller than normal. Vision continued to diminish and the field of vision to contract, and color vision was abolished. The optic disk was regarded as pale, but it was doubtful whether any change in its appearance had taken place. Premature labor was induced at the end of six and one-half months of pregnancy. Within two weeks vision had begun to improve and the fields of vision to increase in size, except that the right inferior quadrant remained almost completely obliterated. After six months vision reached 6/6, and color vision was completely restored.

A similar case has been reported by Valude.

Knaggs concludes: If repeated careful observations show—1, that acuteness of vision is rapidly diminished; 2, concentric contraction of the field of vision, and that this is increasing; 3, color perception impaired; and 4, that there is no disease of the fundus to be seen with the ophthalmoscope—the prognosis as to sight is very serious. The period for expectant treatment has gone by, and abortion or premature labor should be induced without delay. To wait is to run a great risk of permanent blindness; to interfere, if the amblyopia is not too far advanced, is to insure recovery.

CATARACT EXTRACTION.

HIPPEL (*Münchener medicinische Wochenschrift*), after referring to the fact that in spite of the age of the cataract operation and the numerous workers who have labored to perfect it, there is still lack of any full agreement as to the manner of attaining the greatest safety, describes his own method and its results.

The necessary instruments are boiled in a soda solution and then laid in a 2 per cent. solution of carbolic acid. The bandages are sterilized by steam, the cocaine solution by heat. The lids and cilia of the patient are washed with soap, alcohol, and a sublimate solution of 1:2000. The conjunctival sac immediately before the operation is flooded with a 1:5000 sublimate solution. He makes the incision in the limbus, including about one-third of the corneal circumference, with the Graefe knife, and excises a small piece of the iris and as large a piece as possible of the anterior capsule, using capsule forceps. The eye is dressed by dusting a little iodoform on the wound, and both eyes closed with bandage. The eye operated upon is kept closed for four or five days, and the patient confined to bed.

His results have been—vision of one-half or over in 61 per cent., one-tenth to one-half in 36 per cent., less than one-tenth in 2 per cent., and complete blindness in 1 per cent. Of six cases having vision of less than one-tenth, two had old central chorioiditis, two opacities of the vitreous, one was a case of amblyopia, probably congenital, and one partial infection with iritis and pupillary exudate. Division of the capsule for secondary cataract was done in 33 per cent. of the cases.

The Treatment of Corneal Ulcer, with Hypopyon.

The treatment of this condition adopted at the Ophthalmic Clinic of Montpellier (*Nouveau Montpellier Médical*, ann. xxxvi., No. 4) is: After instillation of cocaine, practise antiseptic irrigation of the eye with careful washing of the cul-de-sac of the conjunctiva and of the lacrymal passages. If the ulcer be superficial, the hypopyon not great, the cornea in good condition, and tension of the eyeball not increased, the application of the actual cautery to the margins and base of the ulcer completes the treatment. If the ulcer be deeper, but the cornea not yet threatened with perforation, the use of the actual cautery is combined with a paracentesis. And if the ulcer is deep and perforation probable, the Saemisch operation is practised with cleansing of the anterior chamber and application of the cautery to the margins of the ulcer. This is followed with instillations of cocaine, atropine, eserine, or of sublimate 1:1000, warm antiseptic compresses, and absolute repose of the organ.

Scleriritomy in the Treatment of Glaucoma.

Dr. Nicati (*Annales d'Oculistique*, tome cx., 3me livr. iv.) again calls attention to the value of the procedure he has designated by this name. He finds the results remarkably favorable in the treatment of staphyloma consecutive to necrosis of the cornea, and also in the prevention of this condition. He finds also that it deserves an important place in the treatment of certain secondary glaucomas, but not in primary or essential glaucoma.

The operation is done with a straight lance-shaped knife or broad needle, which is plunged through the conjunctiva, sclera, and iris, until an incision of three or four millimetres has been made, or with the scleratome of Wecker directed toward the centre of the eye. The operation is repeated if the increased tension reappears, generally several times with some weeks' interval.

OTOLOGY.

UNDER THE CHARGE OF

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Acute Suppurative Otitis Media.

Dr. Gorham Bacon, in the *New York Eye and Ear Infirmary Reports*, January, 1893, describes a case of acute otitis media in which it was necessary to perforate both mastoid processes, and in which there was a further complication of typhoid fever; entire recovery took place. The case is consequently one of interest on account of the unusual complications and the difficulties presented in making a diagnosis and prognosis. The patient was first seen on June 1, 1892, and treated for his ear disease. He was discharged July 13th from the hospital. Although the ear symptoms had almost entirely disappeared on August 4th, he presented himself at the hospital complaining of pain in the abdomen. He was readmitted to the infirmary, and on August 13th a diagnosis of typhoid fever was made. By September 12th he was discharged, cured. The difficulties of diagnosis in this case presented themselves in the early stage after the second operation, because the natural inference was made at that time that there was a collection of pus in the cranial cavity in consequence of the ear disease, and the advisability of a further operation in this region was earnestly discussed. It was even supposed at a later period when a third operation was performed on the mastoid, that the patient might have typhoid fever, and, in fact, it was considered at the time of his readmission to the infirmary that he was in reality suffering from a relapse of typhoid fever.

Further Notes on Removal of the Stapes.

Dr. F. L. Jack, in the *Boston Medical and Surgical Journal*, of January 5, 1893, continues his contributions to the history of this operation. He says the practicability of this procedure on the human subject has now been fully demonstrated by several observers, and its value in many cases fully proven. No claim is made that it will help all cases, but it surely does some. In cases of otitis media suppurativa, after the otorrhœa has ceased the incudostapedial joint is firmly fixed by bands of adhesions. This condition of the bone offers a mechanical hindrance to the transmission of sound waves to the vestibule. Relieving this obstruction by removal of the stirrup is found to increase the hearing power for the voice very materially.

Another set of cases is very similar pathologically, namely, otitis catarrhalis adhesiva. There is proliferation of tissue with ankylosis of the ossicular chain. Here, again, good results by removal of the bone have been demonstrated.

There is a third class, namely, otitis media insidiosa (sclerosis), in which it is generally believed that the ankylosis is not fibrous but osseous. This

condition is usually characterized by a high degree of deafness and tinnitus. The appearances of the membrana tympani are said to be either normal or nearly so. Judging from a further experience with this troublesome condition, the region of the foot-plate would appear to be the principal seat of the bony ankylosis according to Dr. Jack. It is needless to say that diseases of the internal ear are not affected by this operation. It must be carefully determined beforehand, therefore, in each case, by special tests, whether the impairment in hearing is due in part or wholly to changes in the labyrinth,

A matter of considerable interest in the removal of the stapes is the effect of its removal on the labyrinth. Theoretically, there should be a general disturbance; practically this is not the case. The symptom vertigo was carefully searched for, but was found in one case only, that of a woman forty-seven years old. Dizziness, however, was an old complaint with her, and was very likely due to dyspepsia. In a few cases, vertigo, which was complained of before the operation, entirely disappeared.

It does not seem from the statements in this paper that the improvement to hearing by the removal of the stapes was marked. In no case did it appear to be injured.

Exploratory Opening in the Tympanum and Subsequent Operations in the Middle Ear without General Anæsthesia.

Dr. Clarence J. Blake, in the *Boston Medical and Surgical Journal*, April 20, 1893, communicates his views upon the above-named subject. He says:

"In view of the recent advances in the surgery of the middle ear, and especially in those cases of chronic non-suppurative middle-ear disease where operation is undertaken for the improvement of the hearing, and in which the exact determination of the character and location in the sound-transmitting apparatus of the obstacles to the passage of the sound-wave is a matter of difficulty, the question of some method of exploratory operation which shall avail of the intelligent participation of the patient has become a matter of considerable importance. It is claimed that an incision in the membrana tympani begun opposite the round window causes increasing pain as it is extended upward and forward along the periphery."

Notes are then given of operations on the membrana tympani and within the drum-cavity. Dr. Blake concludes:

1. That general anæsthesia is not necessary in all cases to the successful performance of operations upon the membrana tympani, nor within the middle ear where these are undertaken in chronic non-suppurative disease for the purpose of improving the hearing.

2. That local anæsthesia by means of cocaine in very small quantity is sufficient.

3. That the exploratory opening of the tympanic cavity, and, if deemed necessary, subsequent operations within the middle ear, in the line of the sound-transmitting apparatus, when done under conditions of local anæsthesia which permit of the conscious and undisturbed co-operation of the patient, afford decided advantages for purposes both of diagnosis and treatment.

4. That when preceded and accompanied by proper antiseptic precautions,

and concluded by a closure of the opening in the membrana tympani with similar care, the danger of subsequent suppurative inflammation is very slight.

OBSTETRICS.

UNDER THE CHARGE OF

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A Fœtus with Various Deformities apparently due to Adherent Amnion.

MACPHAIL (*Glasgow Medical Journal*, 1893, No. 2) reports the case of a woman in her sixth pregnancy. The patient had been bleeding continuously, but not severely, for eight weeks; her previous children were born prematurely, but all lived. All previous labors had been normal, but the puerperal periods following had been long and severe. When seen by the author the fœtus was lying loose in the vagina, with the placenta, which was entire, about two and a half inches in diameter, very thin, of a yellow color and greasy appearance. The uterus was both anteverted and anteflexed, the os being high and directed backward. Examination of the fœtus showed it to be about three and a quarter inches in length, soft, and macerated. The head appeared normal in size and shape, the eyes being normal in situation, but covered in by an integument which was continuous over the whole head, but through which the orbital outlines and palpebral fissures could be seen. There was deficiency of development of the nose and ears. In the nascent state the mouth was covered in by a thin membrane, continuous with that which covered the rest of the head, but which stripped off that part easily. Except a small area over the occiput, the membrane over the head was firmly adherent. The body was normal in shape, the outlines of the various portions being visible through their coverings. The upper right limb was fairly normal in shape, but the forearm appeared dislocated forward at the elbow-joint; the hand was abducted to a right angle at the wrist and had no thumb, but four fingers, of which the outer two were short and stumpy, and all were webbed. The left arm was of normal length, but with the elbow projected forward. Similar deformities appeared in the lower limbs. The feet were represented by one small shapeless mass, into which both legs were continued, no division line between them appearing.

No sign of an anus could be seen, but anteriorly there were parts which resembled a vulva. From this description the author believes there can be little doubt that the case is one of adherent amnion.

A Case of Symphysiotomy in an Extremely Contracted Pelvis; Craniotomy; Recovery of the Mother.

Dimmock (*British Medical Journal*, 1893, No. 1695) reports a case in which symphysiotomy was done on a Hindoo rhachitic dwarf. The patient was found on admission to be a weakly, pale, emaciated woman, four feet three inches in height. The uterus was globular in shape, and fell over the symphysis to a considerable extent. The pelvis was diminutive, the external measurements being: between crests, 8½ inches; between spines, 8 inches; intertrochanteric, 8½ inches; external conjugate, 6 inches. The pelvic opening at the brim was a mere slit, so that the point of the finger could alone enter it. No fœtal heart-sounds could be heard. Symphysiotomy was decided upon on account of the patient's exhausted condition, which rendered the more serious operation of Cæsarean section inadvisable. After section the bones sprang apart about one and a quarter inches; the fœtus was found presenting by the vertex. As the hand could not be passed through the brim without using dangerous force, and the amount of room gave no hope of successful version, it was determined to do craniotomy. The head was perforated, and extraction effected after cranioclasm by the craniotomy forceps.

Before operation the horizontal rami of the pubes were in close approximation, so that the shape of the opening at the brim was in the form of a triangle; but when the joint was cut through they separated, and the conjugate diameter then measured about two and a quarter inches. An Archimedean drill was used, but the bone was so soft that the wound had to be brought together by means of wire sutures passing deeply and close to the bone, with superficial sutures between them. Drainage was used. The patient made a good recovery, and at the time of her discharge from the hospital could walk well. The symphysis united firmly.

Insufflation in the Newborn.

Budin (*Archives de Tocologie et de Gynécologie*, 1893, No. 7) distinguishes two varieties of methods for insufflation—the direct and indirect.

Among the former he classifies: 1, Sylvester's; 2, Schultze's, but neither is sufficient when there is a mucous plug in the air-tubes.

In the latter list the writer mentions: 1, mouth-to mouth insufflation; 2, by means of the tubes of Chaussier and Depaul; 3, insufflation with the tubes of Ribemont.

1. Mouth-to-mouth insufflation. The lips are applied to those of the child and the mucus blown from the throat by way of the anterior nares. It is doubtful if any air goes to the lungs, because of the flaccidity of the air-passages. Should it do so, it drives before it the viscid matter, which will obstruct a certain number of bronchi.

2. By means of the tubes of Chaussier and Depaul. This instrument pre-

sents some inconveniences: both hands are required for closing the nose and mouth, consequently neither is free to support the child's breast and make the air come out completely; moreover, with but one hand it is impossible to practise perfect aspiration.

3. The instrument of Ribemont is excellent for many reasons: it is easy of introduction, requires but one hand, leaving the other free, thus permitting the aspiration of mucus contained in the trachea and lungs.

Any instrumental insufflation is often very difficult; it is a true catheterization. Frequently strong aspiration through Ribemont's tube is necessary in order to draw out the mucus and allow the air to enter the lungs.

The Influence of Corsets upon the Internal Organs of Woman.

Rosenbach (*Der Frauenarzt*, 1893), in an article of considerable length on the subject mentioned above, says that while he admits that in a certain number their use seems to be productive of no ill results, yet this is not the case with the greater number of women. All hollow organs require room for the proper performance of their functions, and this the corset prevents. Especially are they injurious to those who labor with their hands, such as workers with sewing machines, and others who require free bodily action.

A Case of a Monosomatous Monster.

Rouxeau (*Annales de Gynécol. et Obstét.*, 1893, tome xl.) states that monosomatous monsters consist of double monsters with but one body. In the case reported the fœtus, a female, was in good condition, was not macerated, and had entered upon the ninth month of gestation. It is perfect except the head, the form of which is bean-like, placed on a flat anterior hilum. The base of the face is almost perfect. About 2 cm. from the root of the nose a small trunk can be seen, which from its rudimentary nostrils is evidently a second nose. Above the trunk, and at the bottom of a fairly large depression, can be found a cavity, slightly marked, bordered by a badly defined circular fold, evidently a conjunctival cavity containing an eye, which had been detached and extruded during the digital examination at the labor. Further back, just at the culminating point of the head, and on the limit of the hairy scalp, is a pedunculated tumor which, by its connection with the head and by its internal anatomy, seems to be a degenerated and distended ear.

The face is normally conformed, save the superior maxillary and orbits.

There are manifestly two crania, right and left, being so displaced that the median, frontal, and sagittal sutures are directly continuous with each other. The orbital vaults are opposed in their concavity, and reunited so as to form a median orbit of the diameter of a two-franc piece. There is a double optic canal. The sutures and fontanelles are widely open. Spine, straight on the left side, but the development here has been arrested above the fourth vertebræ, due to exaggerated flexion while *in utero*. The brain was completely destroyed by craniotomy and forceps delivery. The author has introduced a number of most excellent illustrations in his report of the above case.

GYNECOLOGY.

UNDER THE CHARGE OF

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Treatment of Inoperable Carcinoma of the Uterus.

Bernhart (*Centralblatt für Gynäkologie*, 1893, No. 39) has obtained highly satisfactory results from parenchymatous injections of salicylic acid in alcohol (6 parts of the acid and 60 parts of the alcohol). About thirty minims are injected into the neoplasm in eight or ten different places. Some patients complained of severe pain during the injections, while others had none at all. There were slight elevations of temperature. The results observed were as follows: Within three days after ulcerating nodules had been thus treated the ulcerations had healed and there was marked retraction at the sites of the punctures. After repeated injections (at intervals of four days) the affected nodules had greatly shrunken and presented a smooth surface on which epithelium later developed. Meantime the patient's general health improved, pain and foul discharges ceased, and there were no further hemorrhages. These results were obtained in six cases of inoperable carcinoma of the cervix, though the patients had not been kept under observation long enough to report as to their subsequent condition.

Gastro-intestinal Disturbances in Pelvic Affections.

Thielabler (*Centralblatt für Gynäkologie*, 1893, No. 41) divides these cases into four classes, viz.: 1. Those in which the pelvic trouble is merely secondary, and no connection can be traced between the two. 2. Those in which both are due to a common cause, such as simultaneous displacements of the kidneys and uterus from general muscular relaxation. 3. Intestinal disturbances, leading to pelvic troubles, such as metrorrhagia, dysmenorrhœa, etc., from coprostasis. 4. Pelvic disease may be the direct cause of atony of the stomach and intestines, periodical gastralgia, etc. The writer denies that there is any distinct form of "uterine dyspepsia."

Erysipelas and Gonorrhœa.

Schmidt (*Centralblatt für Gynäkologie*, 1893, No. 39) reports a case of gonorrhœal vaginitis in a little girl in whom erysipelas of the thigh developed with simultaneous disappearance of the vaginal discharge. Vaginitis is known to be a peculiarly intractable affection in children, yet in this instance it was cured within a few days without local treatment, and there was no recurrence after disappearance of the erysipelas. The apparent causal relation between the latter and the cure of the gonorrhœa is analogous to the effect of the inflammation in cases of inoperable sarcoma.

Conservative Treatment of Chronic Inversion of the Uterus.

Küstner (*Centralblatt für Gynäkologie*, 1893, No. 41) describes an operation of which the details are as follows: A transverse incision is made into Douglas's pouch, and the finger is passed through it into the funnel-shaped cavity formed by the inverted uterus; any peritoneal adhesions can be separated at the same time. The posterior wall of the uterus is then incised longitudinally in the median line from the fundus through the os externum. The organ is then reinverted by pressure with the thumb, while the index finger is kept within the funnel. After replacement, the wound in the uterine wall is closed from the peritoneal side with deep and superficial sutures, and, finally, the wound in the posterior fornix is sutured. In a case thus treated the result was highly satisfactory, the hemorrhage being moderate.

Hæmatosalpinx due to Genital Atresia.

Meyer (*Deutsche med. Wochenschrift*, 1893, No. 39) mentions the following indications for cœliotomy: 1. When hæmatosalpinx is recognized, especially in cases where the atresia is situated high up in the genital tract. 2. In cases in which enlargement of the tubes is detected in patients with congenital atresia who have severe disturbances at the time of the menstrual period. 3. When after evacuating retained menstrual blood tumors can still be made out which may be regarded as distended tubes that cannot discharge their contents into the uterus; even if only one tube is affected, it is better to remove the adnexa on both sides in order to prevent future trouble. The hæmatometra may then be left undisturbed if it cannot be reached from below; supra-vaginal amputation of the affected uterus is an unnecessarily severe procedure.

Gonococci in Prostitutes.

Laser (*Deutsche med. Wochenschrift*, 1893, No. 37) gives the results of bacteriological examinations in six hundred prostitutes. Gonococci were found in the cervical discharges in twenty-one patients who presented only slight clinical symptoms. In only seven out of one hundred and eighty cases were cocci found in the vagina. Out of three hundred and fifty-three patients whose urethræ were examined cocci were found in one hundred and twelve, although in four-fifths of these there was no macroscopical evidence of gonorrhœa. Several patients had been discharged as cured. In two hundred and forty-one patients in whom no gonococci were discovered there was more or less inflammation of the mucosa, often with a suspicious discharge.

The writer infers that purulent vaginal and uterine discharges may be caused by other micro-organisms than gonococci; it is possible that the latter may either be present in such small numbers as to escape detection, or may have undergone degeneration. He thinks that a systematic microscopical examination of the secretions should be made, especially in chronic cases.

As regards the reputed sterility of this class of women, the writer found that out of forty-four who were especially questioned on this point, all but eighteen had had from one to nine children.

PÆDIATRICS.

UNDER THE CHARGE OF

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ASSISTED BY

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DERMOID CYST OF THE MOUTH.

BLOCH (*Prager med. Wochenschrift*, 1893, No. 28, p. 344) records an interesting example of this formation, which was removed from the mouth of a newborn infant by efforts at cleansing. It measured four centimetres by two, and was flattened in the shape of the head of a frog, slit transversely at its free extremity, and having the color of the buccal mucous membrane. Microscopical examination showed that the tumor was composed of an epidermic layer, of a non-papillary chorion, and contained hairs, sebaceous glands, and abundant adipose tissue. It had been attached at the posterior part of the left half of the palatine roof close to the median line. The uvula presented a complete central cleft.

A CASE OF GASTRORRHAGIA IN A NEWBORN INFANT.

AN interesting case of gastric hemorrhage, occurring on the first day after birth, is reported by LORANCHET (*Gazette hebdomadaire de Médecine et de Chirurgie*, 1893, No. 37, p. 436). The vomiting of blood had first occurred about twelve hours after birth, and was frequently repeated in the following twelve hours. The external treatment consisted of frictions with camphor and whiskey, artificial heat, and complete envelopment with warmed cotton wool. Seltzer and sugar water, with a few spoonfuls of coffee, were first given internally, followed by finely pulverized ice covered with milk, a teaspoonful hourly. Minute doses of perchloride of iron were soon added to this treatment, as the stools showed a continuation of the hemorrhage. The child recovered.

The author attributes the hemorrhage to exposure to cold—a cause which he finds is not mentioned by any other writers upon the subject. By this term he understands not brisk chilling of the surface, but slow, progressive, and almost imperceptible refrigeration. In this form cold acts as a general debilitant and depressant of the nervous system; the general circulation is disturbed, the peripheral circulation slowed, the vasomotor system unbalanced. The substitution of the cardio-pulmonary cycle of the newborn for the splanchnic cycle of the fœtus is interfered with, and in this struggle of reflexes there is a reversion to the splanchnic cycle with passive congestion of the gastro-intestinal mucous membrane which gives rise to hemorrhage.

In regard to treatment, the necessity of promptness and energy is em-

phasized. In the statistics of Barthez and Sanné, out of 23 cases 11 died, 9 of them very quickly. The author condemns expectant treatment, and advises a fearless employment of ice and astringents.

Treatment of Chorea and Enuresis by Injections of Testicular Extract.

Deydier (*Lyon Médical*, 1893, No. 16, p. 548) publishes five observations of chorea and three of nocturnal incontinence of urine in children treated by this method. In one case of chorea the improvement was almost instantaneous, and cure was complete after seven injections. In three other cases improvement was observed after the third injection, but cure was not attained until after three weeks or a month of treatment. The fifth case was absolutely rebellious to treatment.

In the cases of enuresis, with one child each injection prevented the incontinence during the night following the injection, but on that night only. In another case, a child of five years was radically cured by one injection and the dread of a second. Finally, a third child was seized shortly after the injection with alarming nervous symptoms (fainting, abdominal pains, vomiting) and the operation was not repeated. The child remained eight days without wetting the bed, and then recommenced it. In all the cases of incontinence suggestion or fear appeared to play an important part.

Except in the single instance mentioned, all the patients bore the injections well. The dose was one half a cubic centimetre. Only a little pain and inflammation at the point of puncture was noted.

Purpura after Vaccination.

Epstein (*Jahrb. f. Kinderheilk.*, 1893, Bd. xxxv. p. 442) records two cases of this kind in a study of the complications of vaccinia. Both cases occurred in infants under four months of age, the first of whom was rhachitic. The hemorrhagic patches of variable dimensions appeared four days after vaccination, their appearance being preceded by agitation, insomnia, and fever. With the first the lesions occupied exclusively the left arm, especially the extensor aspect; with the second they were seated upon the members and the trunk. They persisted for eight days, passing through the usual variations of color. In both cases the vaccination took perfectly, but the contents of vesicles and pustules was never hemorrhagic. In the case of the first infant, five days after the purpura began, measles of non-hemorrhagic character made its appearance, the lesions remaining distinct from the purpuric patches.

In comparing these two cases with the five published by Pfeiffer, the author found that in all the cases the purpuric eruption appeared from the fourth to the eleventh day after vaccination, that its onset was preceded by such symptoms as agitation, insomnia, and fever, and absorption of the blood took place in from six to eighteen days. The author's cases, however, differed from Pfeiffer's in the absence of blood in the vesicles, which had been the first sign of hemorrhage in all the cases of the latter observer; in the absence of hemorrhages from the mucous membranes, and in the more discrete disposition of the lesions.

HYGIENE AND PUBLIC HEALTH

UNDER THE CHARGE OF

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Flies and Disease.

Surgeon-General Sir William Moore (*Medical Magazine*, July, 1893) regards the dissemination of diseases by flies as a matter looked upon with too much indifference, and instances an epidemic of anthrax which was spread by flies which had covered the carcass of a dog thrown into a ditch in Cortal. He quotes the experiments of Sawtschenko with flies and cholera germs, and observes that it is worth noticing that in India it is during the time and season of the greatest prevalence of cholera that flies most abound. The possibility of flies carrying the organisms of typhoid and phthisis is suggested, and the belief is expressed that leprosy is often conveyed by flies which appear to be particularly fond of leprous sores and of investigating anything in the way of a sore on a healthy person.

There is no doubt that ophthalmia is so spread, and an instance is given of complete destruction of an eye from diphtherial inflammation following a sting in the eye by a fly which had apparently risen from a dunghill. That venereal disease is not more frequently disseminated by flies is probably explainable by the fact that the sores are usually on unexposed parts of the body.

Action of Cold on Cholera Bacilli.

An outbreak of cholera occurred in the insane asylum at Nietleben, in the beginning of 1893, at a time when the temperature was twenty degrees and more below zero, Centigrade, and all the rivers were frozen. To determine whether the bacilli would die or be preserved in the ice, a series of experiments was undertaken by Prof. Renk, of Halle (*Fortschritte der Medicin*, May 15, 1893). Water from the Saale was sterilized, cooled, inoculated with cholera germs, and frozen; the ice being finally melted, and cultures made. In the first experiment each c.cm. of water contained, after inoculation, 620,000 organisms. The flask was frozen at — 9.6° C., and exposed to that temperature thirty-nine hours. The cultures made from the melted ice were negative in results. A second test with more richly inoculated water kept in a freezing mixture of ice and salt, gave negative results after one day. Sterilized water so inoculated that each cubic centimetre contained countless bacteria, was frozen, and cultures made from the melted ice after forty-eight and ninety-six hours. After forty-eight hours of exposure each cubic centimetre of melted ice yielded 24,400 organisms, but after ninety-six hours the

results were negative in each of twelve tests. Experiments were undertaken with unsterilized Saale water to determine the influence, if any, of the presence of spaltpilze. A number of bottles of the water so inoculated as to contain 1,483,000 organisms to the cubic centimetre were frozen, and on each following day one bottle was taken, the ice therein melted and examined, then re-frozen. It was found that after five days of uninterrupted freezing all the bacilli are killed, and after six and seven days when the freezing is interrupted. The conclusion is that cholera bacilli cannot develop after being in ice eight days.

UFFELMANN (*Berliner klinische Wochenschrift*, 1893, No. 7) had already begun experiments in the same direction before the outbreak occurred at Nietleben, and was able to utilize the intense cold of January. His results show that cholera bacilli have considerable power to withstand cold and that they succumb only after a certain time, the duration of vitality being seemingly dependent on the degree of cold. There seems to be no essential difference in the behavior of entirely fresh or older cultures of the bacilli.

DIPHTHERIA IN LOMBARDY.

DR. FRANCO MISSAGLIA (*Giornale della Reale Società Italiana d'Igiene*, July, 1893), reporting the results of his investigation of an outbreak of diphtheria in Sommo, Lombardy, during the summer and autumn of 1892, states that the spread of the disease is largely due to the prejudices of the people, who conceal sickness, disobey the physician, and throw away his medicines. Among other circumstances highly favorable to the spread of the disease, he mentions the direct contact of children, who, living in common, easily transmit the infecting bacillus; the indirect contact by means of mothers, of female neighbors, and of domestic utensils; the spitting on the floor, or on sheets and counterpanes not subsequently washed; insufficient means of disinfection; washing of clothes of the infected in water which afterward becomes a focus of disease; absence of cleanliness; and bad drinking-water.

LEPROSY IN INDIA.

THE conclusions of the Leprosy Commission (*Indian Medico-Chirurgical Review*, July, 1893) are that leprosy is a disease *sui generis*, not diffused by hereditary transmission; it must be regarded as contagious and inoculable, yet the extent to which it is propagated by these means is exceedingly small. It is not directly originated by the use of any particular article of food, nor by any climatic or telluric conditions, nor by insanitary surroundings; neither does it affect any race or caste. It is indirectly influenced by insanitary surroundings, such as poverty, bad food, and deficient drainage and ventilation, which cause a predisposition and increase the susceptibility of the individual. In the great majority of cases, it originates from a sequence of concurrence of causes and conditions related to each other in ways imperfectly known. Complete segregation has never yet been possible; in India it is absolutely impracticable. The commission are of opinion that the sale of articles of food and drink by lepers should be prohibited, and that they should be prevented from practising prostitution, and from following such occupations as those of barber and washerman.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Heart Hypertrophy.

In the *Johns Hopkins Hospital Reports*, 1893, vol. iii. Nos. 4–6, is to be found an interesting study by W. T. Howard, Jr., of the cases of hypertrophy of the heart which came to autopsy at the hospital, from its opening in May, 1889, until October, 1892. The record comprises 360 autopsies in all, and of these 105, or 29 per cent., showed cardiac hypertrophy.

From personal studies, and from a careful consideration of the observations of others, Howard fixes at the outset upon standard measurements of the normal heart, in estimating which, the sex, size and weight of the body, and the condition of the ventricles as regards contraction, are all considered. In this connection the interesting fact is developed that under normal conditions, and in the same race, the size and weight of the heart vary with the locality. Thus the weight of the average Berlin, Munich, London, Paris, and Baltimore hearts differs quite materially.

Howard studies his cases more particularly from the etiological standpoint, considering them under the heads of those resulting from intra-cardiac disease and of those dependent upon abnormal conditions outside the heart. As will be seen by reference to the following table, by far the greater number of the cases belong in the latter category.

Table giving the Relative Frequency of the Conditions producing Heart Hypertrophy.

	Cases.	Per cent.
Arterio-sclerosis in	62	59
Nephritis	14	13.4
Valvular lesions	13	12.4
Adherent pericardium	8	7.6
Work	4	3.8
Tumors	2	1.9
Aneurism of heart wall	1	0.95
Hæmic plethora	1	0.95

It will also be noticed that of the extra-cardiac influences, arterio-sclerosis is by far the most frequent cause of heart hypertrophy, considerably more than half the cases being attributable to this cause alone. When considered in relation to age, the etiological influence of vascular disease is even more striking, for of 59 cases of heart hypertrophy of forty years of age and over, 48 cases, or 81 per cent., were due to arterio-sclerosis, and Howard shows that a

knowledge of these facts may be of great diagnostic importance in the differentiation of doubtful cases. It is also believed that well-marked arterio-sclerosis is a very much more fatal disease than simple chronic diffuse nephrits with compensatory hypertrophy of the left ventricle, for the reason that compensatory hypertrophy is very much more easily produced and kept up in the latter than in the former disease, and in either condition comparative health is enjoyed as long as cardiac compensation obtains. And it is further held that in mechanical obstruction to the circulation, cardiac hypertrophy is to be regarded as conservative and greatly to be desired, and that the amount of hypertrophy present, if the individual is in fair health, may be taken as an index of the gravity of the lesion or lesions causing it.

Peritonitis Caused by Proteus Vulgaris.

It is only recently that pathogenic qualities have been attributed to the proteus group of micro-organisms, but the occasional observation of such cases as the following leaves no further doubt upon the subject. After reviewing the evidence as to the virulence of Proteus vulgaris, Flexner (*Johns Hopkins Hospital Bulletin*, April, 1893, iv.) reports a case of fatal peritonitis in which that germ was the only organism discoverable in the peritonitic exudate.

The patient was a young woman, eighteen years of age, who died, two days after admission to the Johns Hopkins Hospital, of a well-defined case of acute general peritonitis. At the autopsy, besides the sero-fibrinous exudate of the peritonitis, a chronic diffuse nephritis and a tubercular ulcer of the intestine were discovered. Cultures from the various organs of the body disclosed the presence of proteus vulgaris alone in the kidneys and peritonitic exudate; in the lung bacillus coli communis was found. As no other cause for the peritonitis was discoverable, Flexner attributes it to the presence of the proteus, and suggests that the lowered tone of the system resultant from the long-continued nephritis, and possibly the previous accumulation of a slight amount of ascitic fluid in the peritoneal cavity, may have afforded the conditions necessary for the pathogenic action of that germ. The tubercular ulcer may have permitted the more ready ingress of the proteus to the peritoneum from the intestine, of which it is a frequent inhabitant.

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